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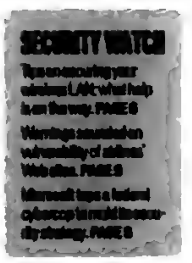
WIRELESS LAN WORRIES MOUNT

Rollouts delayed, systems shut down as organizations scramble for security fixes

BY BOB BREWIN

Concerns about security have commercial and government enterprises moving quickly to reassess deployments of industry-standard wireless LANs. Experts say the security flaws are a potentially severe threat to networked systems within the nation's critical infrastructure.

John Montgomery, chief technical officer at Embarcadero Systems Corp. in Alameda, Calif., said he's working to improve the security of 802.11b wireless LANs that the company has installed at nine West Coast ports. Those wireless LAN infrastructures support container inventory control at the ports. They also track movement and dispatch operations. Cranes and lifts communicate data read from smart tags on cargo boxes to a central database.



When Embarcadero, a division of Oakland, Calif.-based Marine Terminals Corp., installed the wireless LANs, "the issues about security were not well known or publicized," Montgomery said. But after last year's terrorist attacks on the U.S. and heightened concerns over security, he "commissioned a security

Wireless LANs, page 8

PHILIPS TAKES BACK NET DATA CENTER

Bankruptcy of hosting firm speeds move

BY JAIKUMAR VIJAYAN

The financial collapse of Web hosting firm Exodus Communications Inc. prompted a key customer, consumer electronics giant Philips Electronics NV, to accelerate a massive relocation of its Internet data center to an in-house facility.

The relocation project, completed last month, is the first in a series of similar moves that Amsterdam-based Philips plans to make globally in an effort to gain greater control of its IT equipment and networks.

Philips will continue to outsource application management when it makes sense to do so but will keep the equip-

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FIRMS HELD TO PRIVACY PLEDGES

Push for enforcement could spur litigation

BY PATRICK THIBODEAU
WASHINGTON

Federal and state governments are marching companies into courtrooms for breaking their own data privacy pledges. And private lawsuits may not be far behind.

Enforcement actions "will perhaps have a larger impact than legislation" has had on companies thus far, said Zoe Strickland, chief privacy officer at the U.S. Postal Service, during a privacy conference here last week.

Just last month, for example, the Federal Trade Commission settled its first security-related privacy case against Eli Lilly and Co. after the Indianapolis company released nearly 700 customers' e-mail addresses collected through its Prozac.com Web site. In addition, Toys R Us Inc. in Paramus, N.J., paid $50,000 to settle a complaint by the New Jersey attor-

Privacy, page 61

What If...

...you could map out the future?

Complex adaptive systems theory is a new approach to business planning that enables companies to predict future business conditions by crunching current information. Find out how Procter & Gamble is using these systems to improve supply chain efficiency and how Marsh and McLennan has turned to them to anticipate the costs of natural disasters before they occur.

Story begins on page 26.

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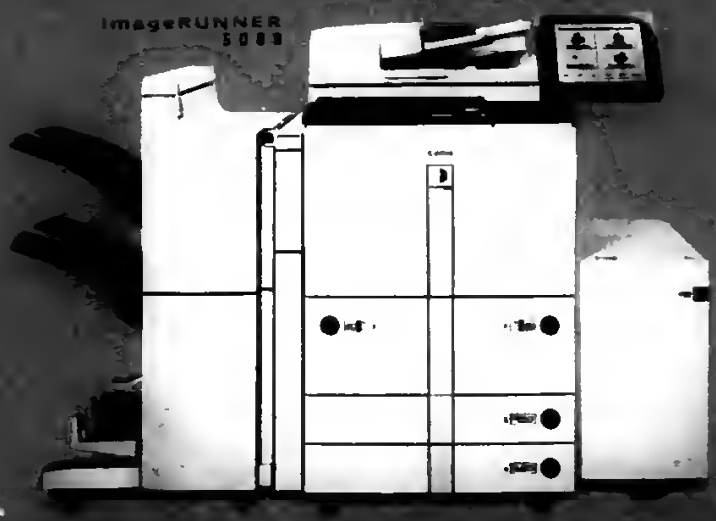

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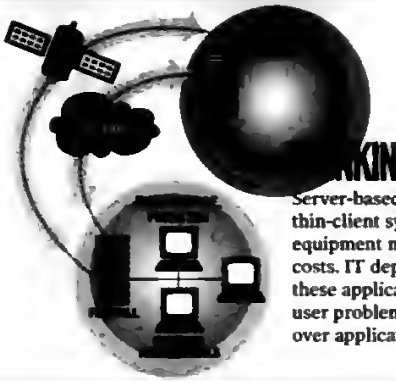
MICHAEL MORGENSTERN

CONSULTANTS IN CRISIS

Historically, IT consultants have been in big demand whenever there's been an economic downturn. Not this time. Instead, independent consultants are struggling to find work and figure out other ways to be productive. **PAGE 30**



...KING THIN

Server-based applications feeding thin-client systems can reduce equipment maintenance and upgrade costs. IT departments are finding that these applications provide fewer end-user problems and offer better control over applications and data. **PAGE 40**

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www.computerworld.com/q?q4000

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ONLINE

CHANGE AT THE TOP

What should Samuel Palmisano's top priorities be at IBM? How would you rate Louis Gerstner's teoure? Post your opinion in our online forum.
www.computerworld.com/q?a1550

.NET TO DOMINATE?

With its .Net framework, Microsoft has quietly pulled ahead of the developer curve and is positioned to dominate Web services with its new application programming interfaces, says community guest columnist Dan Rezick.
www.computerworld.com/community/os

IN LIKE THIN

Read interviews with key industry technologists highlighting ongoing thin-client activities for Windows and Unix. Also: A Tarantella installation and comparison chart of three leading Windows thin-client systems, plus X for Unix.
www.computerworld.com/q?a1540

INSIDE PHP

PHP inventor Rasmus Lerdorf (left) talks about what corporate IT managers should know about the open-source scripting language.
www.computerworld.com/q?24705

AT DEADLINE

Feds Mull Airline Security Network

Federal transportation officials are evaluating the idea of building a network that would link all airline reservation systems to private and government databases for use in screening passengers. Two groups of IT vendors are developing prototypes, but participants said a decision hasn't been made on whether to move ahead with tests or the deployment of such a network.

Antitrust Judge Seeks Settlement Update

The federal judge overseeing the antitrust case against Microsoft Corp. ordered the software vendor and the Department of Justice to file a joint status report and to meet with her Feb. 8 to discuss any last-minute efforts to modify their proposed settlement deal. Judge Colleen Kollar-Kotelly also asked the two sides to set a timetable for proposing changes to the deal.

Linux Group Offers Compatibility Tools

At the LinuxWorld conference in New York, the Oakland, Calif.-based Free Standards Group released a set of application programming interfaces and other tools aimed at boosting compatibility between different versions of Linux. The group also announced an internationalization guide designed to help developers localize Linux technology.

Adobe Signs Deal to Buy Forms Developer

San Jose-based Adobe Systems Inc. agreed to acquire Accelio Corp., a developer of electronic forms software, in a stock-swap deal that's currently valued at $72 million. Adobe surpassed an unsolicited bid that was submitted to Ottawa-based Accelio last month by Waterloo, Ontario-based Open Text Corp.

Citibank Overhauls Overseas Systems

Analysts: Replacing systems, creating cross-border standards may exceed $100M

BY LUCAS MEARIAN

IN WHAT analysts are estimating to be a $100 million-plus project, Citibank is replacing a decades-old set of back-office corporate banking systems in all of its overseas corporate offices with a single platform, which will allow it to create a cross-border set of standard user interfaces and business processes.

The New York-based bank has already completed changeover projects in the Asia-Pacific region, Western and Eastern Europe and Latin America, using a software suite it purchased from an India-based technology vendor spun off by the bank three years ago.

The changeover, which began in early 2000, is expected to continue through 2004. There are still rollouts to be completed in more than 100 countries. Citibank formally disclosed its work on the project late last month.

The bank said the project will pay for itself by letting the company avoid development costs related to a clunky legacy back-office system. Developed in-house in the 1970s, the old system has morphed into 58 disparate software applications, said Jeff Berg, executive director of program management at Citibank's parent, New York-based Citigroup Inc.

"In the '70s, we were growing rapidly in countries around the world. To get up and running quickly, we'd use this system called Cosmos [Consolidated Online Modulated Operating System]," Berg said. "As the bank grew, we did make a mistake in that we released the source code to each of the countries, and they changed it."

Berg said Citibank now has a single system that's customized for each country it operates in, using each nation's language, regulatory rules and business processes.

Although it's not unique, the back-office system replacement is the largest of its kind, analysts said.

According to Avivah Litan, an analyst at Gartner Inc. in Stamford, Conn., mapping historical data is usually the biggest challenge in a systems changeover for an organization of Citibank's size. "Also, it's all the logic on the accounts," Litan said. "They have all these business rules ... embedded in old Cobol code. [In] the old systems, the data and intelligence [are] all in the same programs. They're not separated out into different ones like modern applications."

Both Litan and Octavio Marenzi, managing director at Boston-based Celent Communications LLC, said the project will cost more than $100 millioo and could even run in excess of a half-billion dollars. The ultimate cost of the project will depend on how many consulting firms Citibank uses to help analyze the existing systems and migrate data over to the new platform, said Litan.

Berg said Citibank plans to reduce the number of its data centers in Europe from 18 to about four by standardizing on the new banking platform from i-Flex Solutions Inc. in Bangalore, India. The bank anticipates an 18-month return on investment, said Berg.

The software, called Flexcube, is based on an Oracle database. It automates the general ledger as well as customer accounting, deposits and withdrawals, and interest on accounts, among other services. Instead of addressing multiple platforms, Citibank will be able to simply change parameters in the new software to incorporate a particular country's language, regulations and currency conversions.

"The conversions are quite exciting. Those are weekend kinds of efforts that usually occur around month's end," said Berg. "What we're finding is anytime you install a system like this, you have opportunities to reconsider your business processes. Because we're making the shift from a country to regional back-office system, it definitely gives us opportunity to create ... standardization."

Citistandards

What Citibank had:

- A back-office corporate banking platform built in the 1970s and used in more than 100 countries; because source code was released, the bank wound up with 58 disparate platforms.
- Each platform conformed to local business rules but didn't share information efficiently across borders. Citibank would have to recode the software on each of the 58 platforms to update them for a standard format.

What Citibank will have:

- A single platform based on software from a former offshore development arm of Citibank
- Four data centers in Europe, consolidated from 18.
- Language and regulatory requirements that can be adapted through use of parameters in the software
- A new set of standardized, cross-border business procedures

Citibank: Culture Clashes, Cross-Border Rivalries Inevitable in a Global Project

IT issues aren't the only problems that can surface with a project the size of Citibank's switch of back-office business systems.

"There's a lot of internal rivalries and politics that goes on as well. So it's a very difficult proposition to do," said Octavio Marenzi, managing director at Celent Communications.

Jeff Berg, executive director of program management at Citibank's parent, Citigroup, agreed that the changeover has created some intra-country rivalries. "I think the challenge has been working across the business processes. Operations people defend the way they do things. We keep saying, 'Yes, we know these countries are different, but they're more similar than different,'" he said. "In terms of adopting the Citibank culture, these banks aren't as different as we think.

"We're also dealing with every time zone.... We kind of settled on early-in-the-morning meetings," he added.

Gartner analyst Avivah Litan said there are typically tensions related to getting systems up on a strict schedule. "They'll go through months and months of parallel testing, and finally, when they do cutovers – and that will be done in stages – these people will be up all night," Litan said.

About 250 Citibank IT professionals worldwide are involved in the project, according to Berg.

One way to alleviate such pressures is to set up an extensive testing environment to ensure that when the platform does go live, problems will be held to a minimum.

Citibank has instituted an elaborate testing program that's managed country by country. "The testing involved is the end-to-end tests to make sure not only [that the software platform] Flexcube operates correctly, but the systems it talks to are also operating correctly," Berg said.

Berg said Citibank opted to begin the changeover overseas, but he noted that U.S. systems also run on old, in-house back-office platforms. "We're a global company. We just elected to start [overseas]," he said. "I think down the road, we'll probably tackle it [in the U.S.]."

– *Lucas Mearian*

Kodak Touts TCO Success Amid Global PC, Laptop Rollout

Standardized systems, help desk tools help cut hardware and operating costs

BY MATT HAMBLEN

Total cost of ownership (TCO) for PCs has dropped substantially at Eastman Kodak Co. midway through a three-year global deployment of 40,000 IBM laptops and desktops.

There are several reasons for the reduced costs, a Kodak IT manager said last week, including buying direct from IBM and standardizing its hardware and a set of preinstalled software.

That standardization is replacing an older, more costly process that required Kodak's IT workers to install software on a variety of PCs, said Tooy DiBitetto, director of global desktop and telecommunications services at the Rochester, N.Y.-based company.

DiBitetto declined to disclose exactly how much money Kodak has saved through the IBM deal. But he said going with IBM exclusively saves Kodak 20% to 25% on laptop and desktop hardware, which is still being purchased and rolled out as part of a project that's due to end next year.

Analysts said large companies can reduce their annual cost of ownership by hundreds of dollars per machine, or by as much as 25% during a machine's lifetime, through a rigorous TCO management program.

"TCO is hard to measure, but there are savings possible," said Roger Kay, an analyst at IDC in Framingham, Mass. "If the number of client machines gets big — in the thousands — then it is valuable for enterprises to look at TCO."

Looking Beyond Price Tags

But teaching corporations to look beyond the initial purchase price and consider other TCO factors is arduous, said Mark Margevicius, an analyst at Gartner Inc. in Stamford, Conn. "Reducing TCO is like getting religion," he said.

DiBitetto said help desk staffers at Kodak are now able to resolve nearly twice as many queries by phone, addressing 68% of the inquiries, up from about 35% in 2000. Because it can cost as much as $150 for a help desk technician to look at a machine on-site, the savings add up. "If you make thousands of visits a year, that's a big number," DiBitetto said.

The technology helping Kodak limit help desk inquiries is IBM's Rapid Restore, a software utility that sits on a hidden partition and can be tapped with a help desk call, DiBitetto said. Restores occur within 20 to 30 minutes.

Kodak also saves costs with standard "software images" that can be burned onto PC hard drives at the IBM factory, with delivery within 10 days. The software image includes the Windows 2000 operating system, applications, language utilities, hardware specifications and drivers.

In October, IBM announced management software called ImageUltra that enables it to put a superimage of software on a PC's hard drive that will custom-configure itself to the machine's hardware specifications. That way, laptop and desktop machines can be quickly imprinted with an image or updated, said Kay.

DiBitetto said IBM was chosen in 2000 because Kodak's efforts to cut costs meshed well with IBM's image-management approach.

Margevicius, Kay and Bob Sutherland, an analyst at Technology Business Research Inc. in Hampton, N.H., all said that IBM has been a leader in image management tools. Although the tools could help IBM regain the PC market share it lost last year, the company has had difficulty explaining its various products and their value, they said.

TCO is expected to become a bigger selling point with PC vendors, as corporations seek ways to reduce costs in the current down economy, the analysts said.

"Saving $200 on the [purchase] price of an individual PC is important," DiBitetto said. "But it's nothing like the savings we get from resolving a significant percentage of support issues at the service desk without having to send a technician on-site."

Cost-Conscious

Total cost of ownership of desktop and laptop PCs for businesses

DEVICE	LIFETIME IN ENTERPRISE	ANNUAL COST*
Desktop	Four years	$4,500-$8,000
Laptop	Three years	$7,500-$11,000

*Annual cost includes capital cost, cost of maintenance by service vendors, software support services costs, end-user-owned productivity loss and costs related to connectivity

SOURCE: GARTNER INC. STAMFORD, CONN.

President's Plans Could Help Users, Vendors

IT depreciation change, security spending are key

BY PATRICK THIBODEAU
WASHINGTON

In his approximately 3,900-word State of the Union address last week, President Bush said the word *technology* just three times. Even so, he outlined a message that will have a direct impact on high-tech vendors and users.

High-tech companies could benefit from a rise in federal spending on security. In particular, Bush called for increased use of technology to track arrivals and departures at U.S. borders. The federal government spent $3 billion last year on IT-related security, and analysts said the president's proposed budget, due to be released today, may increase that amount by $1 billion.

"The federal government is our industry's No. 1 customer worldwide," said Robert Cresanti, vice president of public policy at the Business Software Alliance, a Washington-based trade group. "It's pretty clear that when the federal government spends more, the industry does better."

But IT users also stand to gain if Bush's support for an economic stimulus package resonates with Congress.

As part of the stimulus legislation, the U.S. Senate last week approved a compromise two-year, 30% depreciation bonus that lets businesses immediately write off a much larger share of equipment and software purchases than they previously could.

IT managers said the depreciation bonus may prompt them to speed up purchases.

"I don't know if we would dream up new investments, [but] we would certainly move up" some purchases, said Ergin Uskup, CIO at United Stationers Inc., a $4 billion business products distributor in Des Plaines, Ill.

Allen Syopys, CIO at PAR Pharmaceutical Inc. in Spring Valley, N.Y., said, "If you have plans for upgrading your environment anyway, you would accelerate that."

The depreciation bonus will help the high-tech sector, but it won't necessarily trigger an economic turnaround, said analysts. "Maybe it will hasten the end of what's been a capital-spending recession," said French Caldwell, an analyst at Gartner Inc. in Stamford, Conn. But many companies bought more IT equipment than they could "digest very quickly," he said. "They are still in the digestion phase."

However, IT vendors are counting on the accelerated depreciation.

The bonus "is clearly the most important issue for the tech community right now," said Ralph Hellman, senior vice president of government affairs at the Information Technology Industry Council in Washington. "There are no silver bullets to get the tech community revived, but this ... can be very helpful."

The U.S. House of Representatives last year approved a three-year, 30% depreciation bonus. But a similar bill in the Senate sponsored by Gordon Smith (R-Ore.) failed last week. Smith, in an amendment co-sponsored with Max Baucus (D-Mont.), then won approval for the two-year bonus.

Under the plan, if a computer costs $1,000, the purchaser would be able to write off a bonus 30% of the cost in the first year, plus 20% (the normal depreciation spread over five years) of the remaining $700.

What Bush Wants

STIMULUS PACKAGE WITH DEPRECIATION BONUS. Write-offs spread over five years would get a 30% bonus in the first two years.

SECURITY SPENDING. A big increase is expected to be included in Bush's proposed budget.

BROADBAND. Despite a push by high-tech executives to make a national broadband network a priority, Bush was silent on the issue. Insiders say the White House hasn't worked out a plan but wants to support the idea.

Continued from page 1

Wireless LANs

audit, which detected numerous holes."

To address the problems, Embarcadero hired a staff dedicated to cybersecurity, installed firewalls on its routers and is working with third-party software vendors to provide additional encryption software.

TXU Electric & Gas in Dallas, meanwhile, has an ongoing wireless LAN pilot project at its Comanche Peak nuclear power plant in Glen Rose, Texas. But the company doesn't plan wide-scale deployment until it completes a security study, said spokesman Rand LaVonn.

"We are well aware of the security vulnerabilities of wireless LANs," LaVonn said. "We do everything we can do to make Comanche Peak dependable and safe."

The U.S. Department of Energy's Lawrence Livermore National Laboratory in Livermore, Calif., last month put a temporary ban on wireless LANs, which had been installed in nonclassified areas. Ted Michels, the lab's acting CIO and principal deputy director for computation, said in the Jan. 18 issue of the lab's newsletter that "wireless networks and their built-in security features have been found under testing to be very insecure. For this reason, the lab has decided to control the deployment of wireless technologies until solutions can be found to address their security vulnerabilities."

THE COMANCHE PEAK nuclear power plant will hold off on widespread deployment of a wireless LAN until a security study is completed.

> We are well aware of the security vulnerabilities of wireless LANs. We do everything we can do to make Comanche Peak dependable and safe.
>
> RAND LAVONN, SPOKESMAN, TXU ELECTRIC & GAS

Lawrence Livermore spokesman David Schwoegler said the lab would keep its wireless LANs shut down "as long as it takes to get it right." He added that because of these security concerns, the DOE has a longstanding policy against the use of wireless LANs in classified areas.

Federal agencies in general have started to clamp down on wireless LAN deployment, according to Alex Froede, manager of wireless security initiatives in the U.S. government divisioo of Plano, Texas-based Electronic Data Systems Corp. "A oumber of agencies" have curtailed deployment until security can be built in upfront, he said.

Hard to Detect

David Dziadzinla, CEO of San Francisco-based security consulting firm Wholepoint Corp., said be's aware of wireless security audits that have successfully penetrated military facilities from up to 20 miles away. Some of those cases involved military labs that had other LANs attached to the wireless networks. "To detect these penetrations is next to impossible," said Dziadziola.

Brian Ruf, an information assurance scientist at CACI International Inc., in Arlington, Va., said that in his view, running an insecure wireless LAN is "essentially the same as running a wire from your network out to the street and leaving the jack loose for anyone to plug in."

Ruf added that large enterprises face another problem before they even try to deploy strong security: finding the wireless LANs. Wireless LAN installations have "run rampant in large organizations," Ruf said, with users buying the relatively cheap gear and hooking it up to networks without the knowledge of the CIO or IT department.

David Halasz, manager of software development in the wireless networking business unit at Cisco Systems Inc. and chairman of IEEE 802 Task Group I, which is working on wireless LAN security enhancements, said enterprises already have more robust security tools to choose from than weak, built-in Wi-Fi encryption. And they will have even better tools later this year when vendors start adding the hard-to-crack Advanced Encryption Standard to their defensive arsenal.

Dennis Eaton, chairman of the Wireless Ethernet Compatibility Alliance, said he believes that although it's prudent for organizations such as Lawrence Livermore to demand tight security, other enterprises can comfortably operate wireless LANs with today's 40-bit Wired Equivalent Privacy security. ◗

Reporter Dan Verton contributed to this story.

Better Safe Than Sorry

TIPS ON SECURING YOUR WIRELESS LAN:

- **Make sure** built-in 40-bit WEP security is turned on. The factory default is "off," but a security audit will quickly help determine if this is the case.
- **View** wireless LANs as you would the Internet. Don't host any systems or provide access to data on a wireless LAN that you wouldn't put on the Internet.
- **Retrofit** existing wireless LANs with at least 128-bit encryption.
- **Incorporate** proposed 802.1x standards into your wireless LANs. Major vendors currently offer products that include rapid rekeying and message integrity check.
- **Encrypt** all traffic over the LAN with a VPN running at least FIPS-141 triple DES.
- **Follow the feds.** As soon as new hardware (or software) is available, upgrade existing access points and devices so they can use the Advanced Encryption Standard (FIPS-142), the method of choice for federal agencies planning wireless LAN deployments.
- **Make sure** the network door is closed. Firewall all systems connected to wireless LANs and ensure that they are password-protected.

Quick Link For more on he pervasiveness of wireless LANs, visit our Web site.
www.computerworld.com/q?20042

Enhancing Wireless LAN Security

On Jan. 25, IEEE 802.11 Task Group I approved the Temporal Key Integrity Protocol as an optional 802.1x standard.

- Temporal Key Integrity Protocol (TKIP) provides for initialization vector hashing to help defeat passive packet snooping. It also provides a Message Integrity Check to help determine whether an unauthorized user has modified packets by injecting traffic that enables key cracking.
- TKIP includes use of dynamic keys to defeat capture of passive keys – a widely publicized hole in the existing Wired Equivalent Privacy (WEP) standard.
- Task Group I is still assessing which parts of the Advanced Encryption Standard (AES) protocol – which has been adopted by the National Institute of Standards and Technology – to use in 802.11 wireless LANs.
- Task Group I will hold its next meeting on Feb. 11-12 to finalize the draft text. It will then prepare a letter ballot for approval of final standards.
- Some vendors are already starting to incorporate TKIP in new products. Old products can be retrofitted with a firmware upgrade.
- Expect products with AES built into silicon within a year. Software upgrades will take less time but will also degrade throughput due to larger key sizes (128-bit minimum vs. 40 bits for WEP) and configuration of algorithms.

ONLINE RESOURCES:

- IEEE 802.11 Task Group I
- Advanced Encryption Standard

Airline Web Sites Seen as Riddled With Security Holes

But one airline is taking steps to protect itself against browser-based attacks

BY DAN VERTON

Increasing concerns about the potential for hackers to manipulate critical back-end administrative systems through security holes commonly found in corporate Web sites have prompted at least one major airline to take preventive measures.

"We are trying to defend our Web sites," said David Yaacobi, information systems security manager at El Al Israel Airlines at Ben-Gurioo International Airport in Lod, Israel. "Hackers could go inside your Web sites and inject wrong or malicious code."

El Al has deployed Sanctum Inc.'s AppShield 3.1 Web application firewall technology. That deployment comes on the heels of a security audit of a major U.S. airline conducted by the Santa Clara, Calif.-based vendor. According to Sanctum CEO Peggy Weigle, during that audit the airline's Web-based systems were breached. The security team that conducted the audit managed to make its way into the airline's back-end systems, including the reservation and maintenance systems, Weigle said.

"Through a hole in the [front-end] applicatioo code, we were able to get to the back-end systems and able to download the source code of the entire application," said Weigle. "We could have obviously obtained passenger manifests, maintenance systems and whatever was there." The airline, which Weigle refused to identify for security reasons, still hasn't fixed the problems, she said.

Dan Meehan, CIO of the Federal Aviation Administration, said he received a briefing on the audit from Weigle and noted that the FAA is working with the White House to develop a more aggressive outreach program focused on the airlines. "We want to take this specific piece of information and compare notes with a few other airlines to see if this is an isolated case or not," said Mehan. However, he said, it's too early to tell whether the audit did in fact uncover a significant breach of security.

For his part, Yaacobi isn't taking any chances. Although El Al's reservation systems run oo protocols that are "totally different than [standard Internet protocols] and are very difficult to hack," Yaacobi said the potential is still there, and El Al does whatever is necessary to protect them.

"Since Sept. 11, any illegal access to data or transactions through our company Web site is viewed by us as a terrorist act," said Yaacobi. "With regular attempted attacks on our site, we view Web application security critical to our overall security plan ensuring the safety of our customers."

Various Israeli government agencies deployed AppShield during the 2000 cyberconflict between pro-Palestinian and Israeli hackers.

John Pescatore, an analyst at Stamford, Conn.-based Gartner Inc., said Web application security is a serious problem for two-thirds of all corporate Web sites.

"The current generation of firewalls focuses on the network level, kind of like the walls of a fort stopping direct attack," said Pescatore. "However, close to 75% of today's attacks are tunneling through applications. Application-level firewalls are something that any critical infrastructure company needs to look at."

How Hackers Get In

Browser-based attacks exploit bugs and holes in Web-based application code. Vulnerable software includes:

- User interface code, which provides the look and feel of the site.
- The Web server, which supports the physical communication between the user's browser and the applications.
- The front-end system, which interfaces directly with the user interface code, operating system and back-end systems.

Quick Link IT executives meet with DOT Secretary Norman Mineta to discuss airline security.
www.computerworld.com/t/720829

Microsoft Taps Former DOJ Cybercop

Charney to head company's security

BY DAN VERTON AND DEBORAH RADCLIFF

Microsoft Corp. last week named Scott Charney, the former chief of computer crime at the U.S. Department of Justice (DOJ) and a partner at New York-based Pricewaterhouse-Coopers, as its new chief security strategist. He replaces Howard Schmidt, who left the company Jan. 28 to join the Bush administration.

The announcement came late Jan. 31 after *Computerworld*'s Web site broke the news of Charney's appointment earlier in the day. Charney, who had confirmed his selection in a telephone interview, assumes his new position April 1.

The change in title from chief security officer to chief security strategist doeso't indicate a major shift in responsibilities, said Charney. Rather, it's "actually a more accurate description of the role Howard had been filling," he said. "I will he working to secure products and services and developing domestic and international polices that support a more secure infrastructure."

Microsoft officials declined to comment on the appointment at first, but later issued a statement touting Charney's credentials.

"As one of the industry's top computer security experts, Scott has wide-ranging experience in cybercrime and computer forensics, which will make him an essential member of Microsoft's Trustwortby Computing leadership team," said Craig Mundie, chief technical officer at Microsoft.

Sources close to the interview process said that while they wouldo't necessarily place Charney oo the short list of top IT security experts in the country, he landed the job because of his long career at the DOJ, where he earned a reputation as a skilled and staunch antihacking, cybercrime hardliner.

"I realized that [one Microsoft executive] in particular was looking for someone with significant [government] ties and current contacts," said a source close to the selection process. Microsoft "saw Howard [Schmidt] as unique and wanted to define the position around their real needs and the strengths of the new [executive]."

Schmidt left Microsoft to become vice chairman of the President's Critical Infrastructure Protection Board and is admired by many throughout industry and government for having a rare combination of technical and interpersonal skills, especially on Capitol Hill.

CHARNEY knows "the damage that the bad guys do."

Eric Friedberg, a former computer crimes coordinator at the DOJ who reported to Charney indirectly, called him one of the "shining lights" in information security. "He's got national credibility," said Friedberg, who credited Charney with developing the DOJ's computer crime and intellectual property division.

Alan Paller, research director at the SANS Institute in Bethesda, Md., said Charney is the best candidate to carry on Schmidt's Trusted Computing initiative — not because of his technical background but because of his experience at the DOJ.

"Remember the job [Charney] has to do. He has to get marketing-driven development people to delay, assess and correct their tools so they do not cause harm to the outside world," Paller said. "[Charney] is probably the best guy in the country to pull that off, because he comes from the purest understanding of the damage that the bad guys do. What a brilliant choice, because you have to prove to some very strong-willed people that it's worth doing this right."

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2000-based servers running distributed applications. And it has the lowest price-to-performance ratio of any competitive platform.*

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Lotus Ties Notes, Domino To Java for Web Services

Messaging, collaboration releases will support J2EE specification

BY JENNIFER DiSABATINO
LAKE BUENA VISTA, FLA.

USING JAVA 2 Enterprise Edition (J2EE) as the linchpin, Lotus Software Group and parent IBM last week laid out an integrated collaboration and Web services strategy for Notes and Domino. The plan made some large users happy but left smaller customers wondering how it will affect their development strategies.

At its annual Lotusphere user conference here, Lotus announced that it is basing its Web services strategy on J2EE. Notes 6 and Domino 6 will support the specification and include J2EE-compatible development tools when they're released for beta testing this month. Shipments are due to start in the third quarter.

Large Lotus customers, such as Hewitt Associates LLC in Lincolnshire, Ill., and Amsterdam-based Philips Electronics NV, were heavily consulted on the J2EE plan.

Frank Butstraen, head of collaboration and Web services initiatives at Philips, said he plans to make significant investments to integrate Domino with Web services. By using J2EE as a standard, Lotus will allow Philips to cut out some of the expensive, third-party middleware technologies it now uses, he said.

Likewise, Scott Pitt, manager of the knowledge management group at Hewitt, said the J2EE announcement came as no surprise to his company, which plans to build Web services applications on top of Domino 6.

One of the goals of the new strategy is to entice users to run all-IBM software shops by making it easier to integrate Domino and Notes with IBM's WebSphere application server and the system management tools developed by IBM subsidiary Tivoli Systems Inc.

"I'm not going to say that they've got every piece of the puzzle, but they've got a lot of them," said Dana Gardner, an analyst at Aberdeen Group Inc. in Boston.

Eugene Stein, director of information and professional services at New York law firm Shearman & Sterling, said he is looking for reassurance from Lotus that his investment in Domino will be protected as he moves forward with Web services. With J2EE, that appears to be the case, he said.

But Domino 6 won't have the native ability to put some J2EE-compliant applications in Web containers, which use servlets, Java server pages and Enterprise JavaBeans to push applications out to the Web. WebSphere development tools will have to be used for that.

Some developers expressed concern about that scenario during a session at the conference on J2EE development in Domino 6. But Jeff Calow, a senior technical staff member for messaging and collaboration at Lotus, said IBM's WebSphere Developer software will be bundled with Domino 6 at no extra cost.

IBM continues to offer collaborative tools that can be used in mixed application environments, said Daniel Rasmus, an analyst at Giga Information Group Inc. in Cambridge, Mass. That differentiates it from rival Microsoft Corp. and lets users deploy products such as Lotus' QuickPlace online meeting software without using Domino and Notes as their collaborative and messaging infrastructure, Rasmus added.

What's Next

In addition to support for J2EE, IBM and Lotus plan to include the following features in Notes 6 and Domino 6:

FOR END USERS: Roaming user and multiuser support; improved wireless access; updated mail and calendar user interfaces

FOR DEVELOPERS: Integrated connections to external data; added support for Web development features

FOR ADMINISTRATORS: Improved transaction logging, clustering and network compression; remote management and security enhancements

Quick Link To read about Lotus' battle with Microsoft for messaging market share, visit www.computerworld.com/q/720934

Oracle Puts Limits on New Software Pricing

Users must spend $250,000 to qualify

BY MARC L. SONGINI

Looking to assuage user concerns, Oracle Corp. last week finally offered up details on its new flat-fee business applications pricing scheme — including a $250,000 minimum purchase requirement.

Companies will also have to buy software licenses for at least 20% of their workers to qualify for the flat-fee pricing (see chart). Jacqueline Woods, vice president of global practices at Oracle, said the new approach is an attempt to reduce costs and licensing complexities for large companies that are standardizing on its E-Business Suite 11i software.

Oracle claimed companies that qualify could cut the prices they pay by up to 75% per user through the new pricing, which sets all-encompassing 11i license fees of $4,000 for full-fledged users and $400 for workers who need to access only such things as e-procurement and employee self-service applications.

The move to clarify how the new scheme works came two weeks after Oracle CEO Larry Ellison announced the flat-fee plan without fully spelling out what it would entail. But some users said they're still not sure whether the new pricing will benefit them.

Jeremy Young, president of the Atlanta-based Oracle Applications Users Group (OAUG), said the independent organization continues to have questions about what the flat-fee scheme means for users.

"So far, we're still not completely clear," he said. "We'd like to see some [real] examples ... so we can do comparisons." Some OAUG members were having trouble getting price quotes from Oracle's sales force, added Young, a business process manager at DHL Worldwide Network NV in Brussels.

In a preliminary statement about the new approach, the OAUG's pricing council said Oracle's stated objective is to lower costs for users that buy the full 11i suite. "This pricing model seems to favor businesses that adopt that philosophy," the council said.

Ken Gordon, an IT manager for the city government of Oakland, Calif., said he plans to upgrade to 11i by year's end. But the city's IT budget is approved well in advance of such projects, and he said any pricing changes that impact the budget "could be devastating."

However, Woods said Oracle will maintain its current "component" pricing, in which applications are sold individually, for users who don't qualify for the flat-fee model or don't want to buy the full 11i suite.

The flat-fee pricing was due to take effect Friday, Woods said. In a switch from what Ellison announced, the license fees don't distinguish between "power" users and "casual" users. Anyone who uses the core functionality of an application would need to have the more expensive "professional" license, according to Woods.

The $4,000 fee for full application access is a bargain for companies with users who need to access multiple 11i modules, said Erin Kinikin, an analyst at Giga Information Group Inc. in Cambridge, Mass. But it's not so attractive for users who work with only one application, she added.

Details, Details

How Oracle's new flat-fee pricing works:

- Licenses for "professional" users who need full access to one or more applications are priced at **$4,000 per person.**
- Fees for users who need only self-service tools, such as Oracle's expense-reporting module, are priced at **$400 per worker.**
- To qualify, companies have to spend at least $250,000 and buy licenses for **20% of their employees.** Half of those must be for professional users.

Joris Evers of the IDG News Service contributed to this report.

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Joris Evers of the IDG News Service contributed to this report.

Otis wanted valuable customer information at the push of a button.
(You know elevator people.)

COGNOS

BRIEFS

Allmerica Taps Keane For Application Work

Worcester, Mass.-based Allmerica Financial Corp. signed a seven-year deal to outsource development and maintenance of applications for its property and casualty insurance systems to Keane Inc. About 140 Allmerica IT workers are being transferred to Boston-based Keane as part of the deal, which comes 13 months after the companies signed a similar agreement for Allmerica's variable annuity unit.

Microsoft: Win 2000, NT 4.0 Domain Flawed

Microsoft Corp. warned that a flaw in the way its Windows 2000 and Windows NT 4.0 server operating systems authenticate users across domains could allow a user with administrator privileges to extend that power to other domains. The vulnerability is "extremely difficult" to exploit, Microsoft said, but it added that the worst-case scenario posed by the flaw is serious.

IT to Play Big Role In Railroad Project

Brookings, S.D.-based Dakota, Minnesota & Eastern Railroad Corp. said it plans to rely heavily on technology as part of a $1.5 billion, 600-mile railroad construction project in Wyoming and South Dakota. The project will include computer modeling of train operations and the development of a communications-based control system, the company said.

Short Takes

Santa Clara, Calif.-based PALM INC. announced a handheld device with built-in wireless capabilities that's designed to provide secure links to corporate e-mail servers. . . . INTEL CORP. and HEWLETT-PACKARD CO. said they plan to support an effort to create an open-source version of MICROSOFT's Internet-based .Net technology.

IT Managers Make EAI Projects a Top Priority

Application integration gains in importance, but packaged tools still a challenge to use

BY MICHAEL MEEHAN

For some large companies, the need to tie together incompatible systems has grown to the point that the main mission of their IT departments is shifting from application development and support to integration.

Users such as Corporate Express Inc., Best Buy Co. and Union Pacific Corp. said they no longer have any choice about braving the rigors of building an enterprise application integratioo (EAI) infrastructure. EAI tools still have a reputation as being difficult to use, but IT managers at those companies said trying to cope with "application spaghetti" is worse.

"We really need to make integration a central part of every IT initiative," said Marty Malley, director of information systems at Omaha-based Union Pacific. For example, he said, the railroad has to find a way to deliver real-time pricing information from its systems to freight customers in the oil and gas industries.

"That price data touches many internal systems, and now we've got to find a way to tie it all together," Malley said.

In November, Union Pacific began working with EAI tools developed by Palo Alto, Calif.-based Tibco Software Inc.

Once in place, the integration framework will also be used to help migrate components of the railroad's core transportation control system off of its mainframes. But Malley said the railroad hasn't set a full road map for the EAI work. He also wouldn't comment oo the project's expected cost.

EAI Expansion

Monty Sooter, CIO at Corporate Express, said EAI technology will play a role in all four of the major IT projects the Broomfield, Colo.-based office supplies distributor plans to take on this year. "We made a business decision that the [integration] infrastructure has to be correct," Sooter said. "If it's not, we're not going to be able to move forward."

In a project that began 18 months ago, Corporate Express initially used EAI tools developed by Fairfax, Va.-based webMethods Inc. to integrate its systems with the business-to-business applications of 120 large customers.

Now, Sooter said, the company plans to use the tools in rollouts of Dallas-based i2 Technologies Inc.'s online procurement and warehouse management applications. They will also be used as part of projects aimed at improving information feeds to Corporate Express' suppliers and for developing an online system for paying its sales force. The EAI layer will funnel data among various databases and front-end system interfaces, Sooter said.

Tyler McDaniel, an analyst at Hurwitz Group Inc. in Framingham, Mass., said early versions of EAI tools were difficult to use. But improved business object, repository and graphical user interface capabilities have lessened their arcane nature, he said.

> We really need to make integration a central part of every IT initiative.
>
> MARTY MALLEY, DIRECTOR OF INFORMATION SYSTEMS, UNION PACIFIC

However, EAI projects can still be long and hard.

For example, Best Buy plans to use webMethods' tools to patch its electronic data interchange (EDI) trading partners into a new Windows 2000 server backbone that's being installed to run its inventory and financial systems.

The Eden Prairie, Minn.-based electronics retailer has such a heavy volume of EDI transactions that it's running short of the nightly downtime needed to complete its batch processing, said Patricia Vessey, e-business communications manager at Best Buy.

The webMethods tools will translate data among various systems for real-time transaction processing of purchase orders and invoices, Vessey said. But she estimated that it will take two years to do the required data-conversion work.

Correction

A story included in the Jan. 21 Technology Center on Enterprise Networking ["Inspecting the Net"] misidentified a service used by Global Crossing Inc. Global Crossing Telemanagement subsidiary provides network management services.

EAI Adopters Face Steep Learning Curve

Steve Kaufman and his staff have entered EAI boot camp.

Kaufman, director of IT infrastructure for the Goshen, Ind.-based Mennonite Mutual Aid Association, is responsible for developing an integration framework based on tools from Vitria Technology Inc. in Sunnyvale, Calif. The EAI setup is expected to help the health care organization migrate its core applications from IBM AS/400s to Windows NT servers and more than double its system-to-system interfaces over the next five years.

But Kaufman said IT workers at Mennonite Mutual Aid are still learning how to use Vitria's tools, a process that will likely take several more months. "It's complex software, and there's lots of training involved," he said. "It's going to be a while before we can do any testimonials."

The IT team at Best Buy started learning the ins and outs of webMethods' EAI software in August. "We're finding it's complex but we need to learn it if we want quicker reconciliation and better data accuracy in our e-commerce systems," said David Nelson, products capabilities manager at Best Buy.

Best Buy wants to convert its EDI trading documents to an XML format. But that will require detailed data-mapping work, Nelson said. He added that the company also needs to set well-defined workflow routines for the data that it plans to funnel through the EAI infrastructure. The data comes from more than 600 suppliers.

Also, since XML lacks EDI's maturity, it doesn't cover all of the same trading contingencies. Nelson noted that webMethods has pledged to address any problems that may arise as Best Buy goes through the mapping process.

– Michael Meehan

It would have been a great day in Detroit...

...too bad the proposal is still in Denver.

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Packaged Apps Not Always a Good Fit

Retailers need more scalability, features

BY CAROL SLIWA

RETAIL-SECTOR CIOS said last week that they still face challenges finding packaged software to meet their needs, particularly in the supply chain areas.

Such difficulties plagued Kmart Corp., which took a $130 million write-off in September for supply chain software and hardware. The Troy, Mich.-based retailer sought bankruptcy protection last month due to business problems that were exacerbated by the need to enhance supply chain systems, analysts have said.

Retailers face such unique business issues that they have nften been forced to write their own software or heavily customize packaged applications. Several retail CIOs said commercial offerings are improving, but it's still hard to find adequate supply chain software.

Jerry Miller, CIO at Sears, Roebuck and Co., said most nf the Hoffman Estates, Ill.-based retailer's supply chain systems are homegrown because packaged applicatinns haven't been able to scale to handle the high transaction volume and massive inventory Sears has.

"There has been some progress in this area by some vendors," Miller said, noting that Sears is starting to evaluate packaged applications. "If it can he shown that we can install, run and support a packaged [product] less expensively than homegrown, we have no problem bringing it in."

But right now, Sears finds itself turning to in-house IT staffers to design systems to scale and integrate its applications, Miller said.

Phillip Maxwell, CIO at The Neiman Marcus Group Inc. in Dallas, said his company has 45 stores — far fewer than Sears or Kmart — but is still "pushing the limits" of some software packages. Nevertheless, Maxwell said, Neiman Marcus will probably purchase a new merchandising system in a couple of years to improve data analysis capabilities.

"It may not hit everything that Neiman Marcus wants tn do," he said. But the system will provide a quicker way to get more functionality, easier upgrades and the chance to lessen the need for in-house development, Maxwell said.

Some retailers have found themselves modifying packaged applications so heavily that that they have essentially rewritten them. Kmart, for instance, said it extensively customized a warehouse management system from Dallas-based Exe Technologies Inc. A Kmart spokeswoman claimed that the Exe package "was not doing the job we needed it to do," so Kmart decided to take a write-off on the software in September, even though it had just been installed in 1997.

Exe CEO Raymnnd Hood said his firm advised Kmart against heavy customizatinn. He contended that the warehousé management system could he upgraded and serve the retailer well, as it has at other firms, including one of Kmart's major suppliers.

Several retail CIOs said they're trying to avoid heavy customization. Wolly Morin, CIO at New York-based Ann Taylnr Retail Inc., said modifying packaged software can open the door to lots of problems.

Lesson Learned

Bill Finefield, CIO at Virginia Beach, Va.-based Navy Exchange Service Command (Nexcom), which handles $2 billion in sales across 112 stores and about 500 selling locations, learned about the dangers of customization the hard way. In 1993, prior to Finefield's arrival, Nexcom decided tn replace obsolete, decentralized homegrown systems with packaged merchandising, planning, distribution, human resources and financial systems.

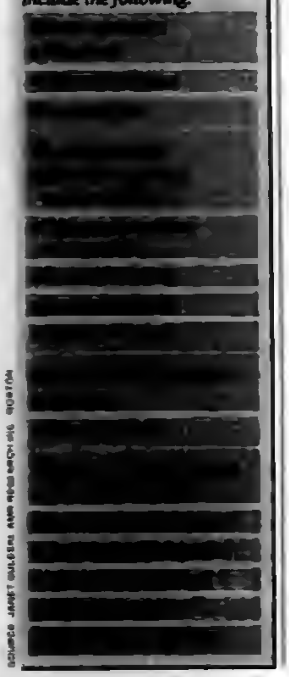
Some nf that software was so heavily customized that Nexcom had to do extra work to make it Y2k-compliant, rather than being able to rely on the vendors' fixes. "We were guilty of doing heavy customization, and we have now learned our lesson," Finefield said.

Nexcom now plans to replace two of its 5-year-old applications with a majnr new merchandise package from Minneapolis-based Retek Inc.

Finefield said that this time, Nexcom will "go with as pure a product from the vendor" as possible to speed deployment and simplify maintenance.

Retail Ware

Major systems that a typical large retailer might use include the following:



SOURCE: JANET GALEGA AND ROSS MARCH, IDC, BOSTON

Teddy Bear Maker Prepares for Second Attempt at ERP Rollout

BY MARC L. SONGINI

After a three-year saga that included a $10.3 million financial hit from the failed installation of packaged applications, teddy bear maker Russ Berrie and Co. is taking another crack at retiring its legacy systems.

The Oakland, N.J.-based distributor of toys and gifts last week finalized plans tn roll out J.D. Edwards & Co.'s OneWorld Xe suite of enterprise resource planning (ERP), customer relationship management and financial applications. The multimillion-dnllar project is scheduled to he done in phases over the next 18 months.

Russ Berrie CIO Michael Saunders said that the company, which had sales of $225 millinn during the first nine months of last year, hopes the OneWorld system will help it reach $1 billinn in annual revenue in the coming years.

Within the next 12 months, he said, Russ Berrie plans to begin installing the applicatinns one department at a time, starting with a stand-alone implementation in purchasing. "We're not going big bang," Saunders said. "We're mitigating implementation risks by taking a phased-in approach."

The company has reason to be cautious. Three years ago, a Y2k-related migration from its homegrown distribution, financial and customer service systems to packaged ERP applications hit a hrick wall. Saunders said the problems were severe enough for Russ Berrie to take many of the new applications off-line.

That forced the company to resurrect its aging Digital Equipment Corp. VAX systems and make them Y2k-compliant. "It was not a fun process," Saunders said, adding that it strained both the IT department and business units.

Saunders wouldn't identify the software vendors that were involved in the failed implementation, but sources said that SAP AG's applications were part of the 1999 project.

A spokesman at SAP confirmed that Russ Berrie was one of its customers, but he declined to offer further details because of pending litigation between the two companies.

Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Daly City, Calif., said it appears that Russ Berrie "bit off more than they could chew" on the 1999 project. Companywide rollouts are especially risky for midsize businesses, Greenbaum said.

In an attempt to protect itself the second time around, Saunders said, Russ Berrie hired a law firm with experience in the IT market. Washington-based Shaw Pittman LLP assisted the company during the software selection process.

Saunders declined to disclose the exact cost of the J.D. Edwards project. Some limited software customization work will be required, he said.

AT A GLANCE

The Bear Necessities

Russ Berrie and Co. CIO Michael Saunders offered the following advice to IT managers planning ERP projects:

UNDERSTAND YOUR COMPANY'S BUSINESS NEEDS and develop well-documented technical requirements before considering proposals from vendors.

MAKE VENDORS DO SOFTWARE DEMONSTRATIONS that involve your company's specific business processes.

KEEP BUSINESS USERS INVOLVED in the decision-making process to ensure that the software you choose is a good fit.

Trade Matching Causes Integration Headaches for Banks

BY LUCAS MEARIAN

One of two companies vying to offer automated trade-matching capabilities to the brokerage industry announced last month that 17 Wall Street firms have signed up for its services. But banks that process stock trades will likely end up having to integrate their back-end systems with the networks of both trade-matching providers.

That prospect doesn't sit well with Tom Perna, senior executive vice president of investment services at The Bank of New York Co. "It's absolutely ridiculous that we're essentially having to do the work twice," he said.

For users like Bank of New York, such integration projects are expected to require millions of dollars and thousands of man-hours. "Relative to Y2k, it's not as big, but it is a sizable undertaking," Perna said.

Bank of New York is one of five so-called custodial banks that signed up two weeks ago to use the trade-matching services of Boston-based Omgeo LLC. The banks work with brokerages to authorize the release of funds that are used to cover stock trades as they are finalized — a process that can take several days.

Picking Up the Pace

As part of an effort to speed up that process, rival services are offering to let brokerages, banks and clearinghouses match data about trades via IP-based virtual private networks linked to back-end mainframes.

Omgeo, which is jointly owned by Depository Trust & Clearing Corp. in New York and Thomson Financial in Boston, competes with the Global Straight Through Processing Association (GSTPA) in Zurich.

While the Securities and Exchange Commission is forcing Omgeo and the GSTPA to set up portals for sharing information, Perna and others in the financial services industry said they would rather see the two services combine to set up a single matching engine. "What started out as an absolutely great idea with the GSTPA has turned into a cross-border political nightmare," Perna said.

Bank of New York has already begun work on connecting its processing systems to Omgeo's matching engine and expects to complete the integration this year, he added.

Gary Foster, chief technology officer at Omgeo, said the integration process takes a matter of months in most cases. Even a brokerage or bank with highly automated back-end systems has to use Omgeo's application programming interfaces and messaging specifications, he noted.

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Wednesday, March 6th at noon

DAVE DeWALT
CEO, Documentum
Putting Information Assets in the Content Ecotecture
Thursday, March 7th at 9:00 am

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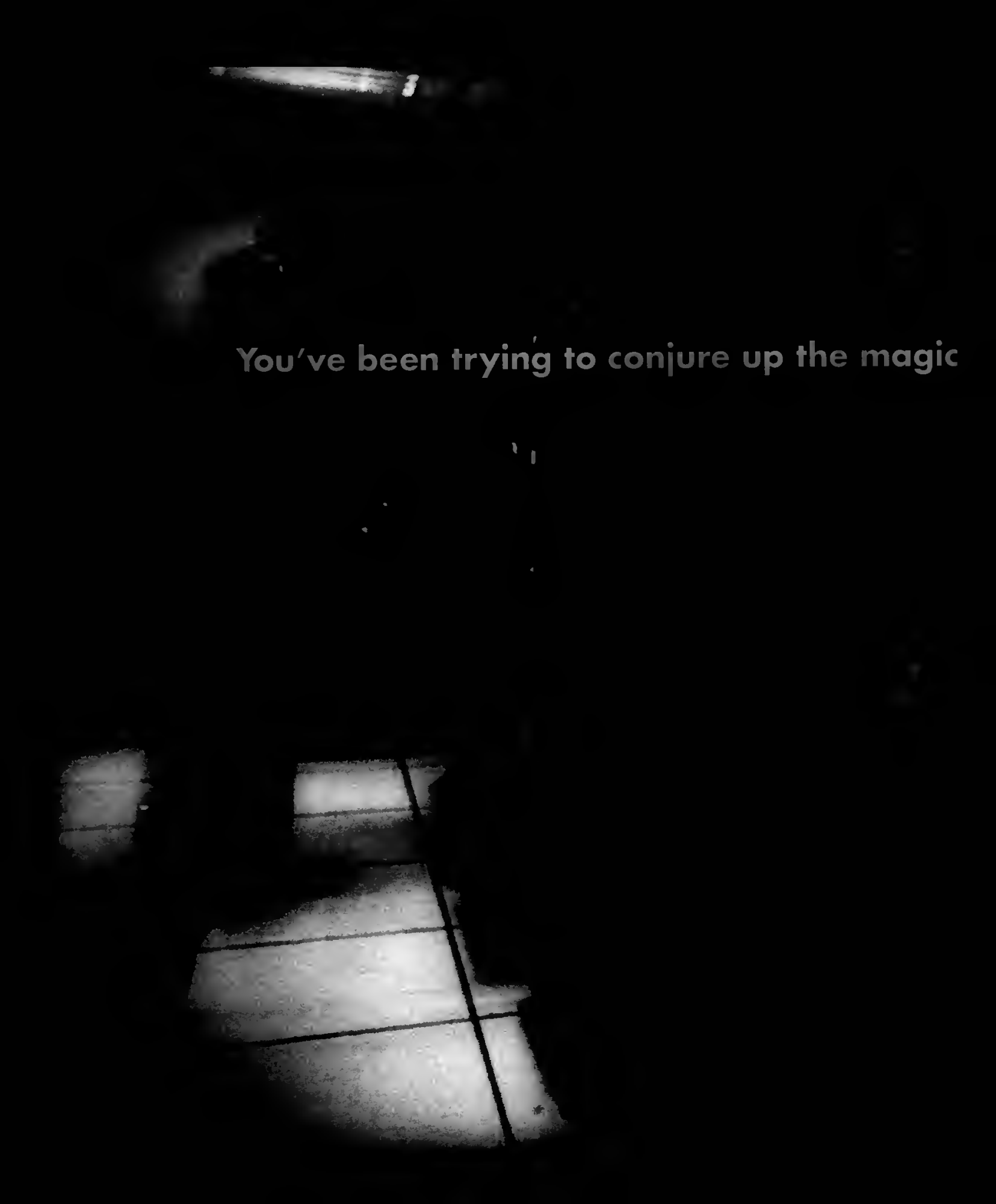
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New Sony CIO to Focus on Tighter Integration

Plans to centralize IT operations, push common processes

BY JULIA KING

Sony Electronics Inc. last week named **James Milde** as its CIO, giving him responsibility for IT at eight major manufacturing operations in North America and 100 other facilities in the U.S. Milde, 41, fills a job last held by Bill Gauld, who left the Park Ridge, N.J.-based consumer electronics maker three months ago to take another job. Milde was previously CIO at The Pepsi Bottling Group Inc. in Somers, N.Y. In his new role at Sony, Milde will serve about 20,000 users. He spoke with *Computerworld* about his plans for the company, which accounts for about 60% of parent Sony Corp.'s total revenue.

What are your top priorities going into the new job? First, getting to know the people in the IT organization and the business people. . . . There's a great opportunity here to get tighter business alignment between the business functions and the IT organization. We have [various] legacy systems where everything is done differently, so there's a huge opportunity to rethink the whole business process. We also have multiple [sales] channels, and in some of those channels, we also have multiple business models. We want to move toward common processes.

What kinds of IT projects will that involve? The top IT projects will be in three areas. The first is order management and order fulfillment. We have a large project in the works with Oracle's order management [software] supporting our customized computer business. Another big initiative is around using SAP [applications] to replace our legacy order management systems for the electronics business. . . . There's also a lot of work around data warehousing and data mining.

SONY CIO Milde: ROI on IT projects will be a priority.

Are there any particular challenges associated with taking on a new CIO position in the midst of an economic downturn? For example, are you under increased pressure to demonstrate a positive ROI from technology investments? Absolntely. With every project — whether a company is fat, dumb and happy or economically challenged — you have to look at project ROI from a capital perspective and really force the business case around it. Too many companies don't put that kind of rigor in upfront. That's a discipline that, if it's not here, we'll make sure it gets put in place. We also want to make sure we have the right processes in place to make sure big projects not only get funded but have the staying power to have [senior management's] commitment day in and day out.

How will you organize, or reorganize, Sony's IT group? The IT organization was very decentralized. It's by and large the reason we have a lot of disparate legacy systems that don't talk to each other. As part nf my accepting this position, it was important to me to have one IT nrganization with one culture, one set of tools and nne set of methodologies to build solutions going forward. So we have [already] restructured. ◗

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No Big Shifts Expected As IBM Switches CEOs

Palmisano to take reins from Gerstner

BY LEE COPELAND

LAST WEEK'S announcement that Samuel J. Palmisano will take over as IBM's CEO on March 1 culminates a long process in which he was groomed to replace top executive Louis V. Gerstner.

INCOMING IBM CEO Samuel Palmisano

Palmisano, a 29-year IBM veteran who has spent his entire career at the company, had a big hand in setting its strategy while working as president and chief operating officer for the past 16 months. As a result, analysts don't expect him to make major changes in direction right away.

Palmisano also ran several key business units before he was picked for the operations job, including IBM's Enterprise Systems Group, its PC business and its IT services unit.

Palmisano has "certainly worn the right hats to lead IBM," said David Mastrobattista, an analyst at Giga Information Group Inc. in Cambridge, Mass. "When you see someone as the group vice president of so many divisions at IBM, you know that doesn't happen by accident."

And unlike when Gerstner was brought in to rescue IBM nine years ago, Palmisano isn't taking over a struggling company. Although IBM reported less-than-stellar results for last year's fourth quarter, it has managed to do better financially than most other top technology vendors during the current recession.

"IBM is in a good position right now," especially compared with other server vendors, said Steve Josselyn, an analyst at Framingham, Mass.-based research firm IDC. He described Palmisano as a solid leader who understands the hardware side of IBM's business, which still runs neck-and-neck with services for the largest share of the company's revenue.

IBM's fourth-quarter net income dropped 13% year-to-year to $2.3 billion, while revenue dipped 11% to $22.8 billion. The company's hardware and services businesses were both down in the quarter, but Gerstner blamed the decline in total revenue primarily on soft sales of PCs and the components that IBM sells to other vendors.

In the past few years, IBM has become more of a competitive force in several key markets where it previously lagged, such as Unix servers, storage and nonmainframe databases. The company has also significantly built up its services and software businesses, and it's one of the leading advocates of Linux technology for corporate uses.

Palmisano has been a strong proponent of using Linux to unify IBM's various server lines. Users and analysts pointed to the support for Linux as a factor in the uptick in mainframe sales last year, the first since 1989.

"Linux opened up a whole new market for the mainframe," said Dave Ennen, technical support manager at Winnebago Industries Inc. in Forest City, Iowa. "For any application that comes down the pipe, we'll investigate if we can run it on [our] mainframe. That's our first option."

OUTGOING IBM CEO Louis Gerstner

The CEO changeover will take place on Gerstner's 60th birthday. That's also the day his contract with IBM expires.

Palmisano, 50, joined IBM as a salesman in 1973. ●

Quick Link What should Palmisano's top priorities be? How would you rate Gerstner's tenure at IBM? Visit our online discussion forum.
www.computerworld.com/q?id5568

RESUME

Samuel J. Palmisano

Recent jobs held at IBM by the company's incoming CEO include the following:

SEPTEMBER 2000 TO THE PRESENT: President and chief operating officer

OCTOBER 1999 TO SEPTEMBER 2000: Senior vice president of the Enterprise Systems Group, with responsibility for servers and storage devices

JANUARY 1998 TO OCTOBER 1999: Senior vice president of IBM Global Services, the company's IT services business

AUGUST 1997 TO JANUARY 1998: Senior vice president of the Personal Systems Group, which included IBM's PC and network computing units

JANUARY 1993 TO AUGUST 1997: President of Integrated Systems Solutions Corp., an outsourcing subsidiary that's now part of IBM Global Services

Gerstner Credited With Turnaround

When Louis V. Gerstner was hired as IBM's CEO in 1993, the short-term objective he was given by its board of directors was simple, according to an internal memo he wrote last week: "Save the company."

Gerstner joined IBM in the midst of a deep crisis. The company was losing money and was thought to be in danger of going the way of many other once-dominant hardware vendors that missed the shift from proprietary mainframes and minicomputers. Even the namesake IBM PC business was passing IBM by.

But Gerstner gets credit for turning the company around. IBM still isn't viewed by analysts as a high-growth company, but it has become competitive across a broad range of technologies where it was previously an also-ran.

Gerstner was also praised for significantly increasing IBM's focus on the lucrative IT services market, to the point where services revenue surpassed hardware sales during the second half of last year.

"In the past, services was [an afterthought] offering at IBM," said Tom Bittman, an analyst at Gartner Inc. in Stamford, Conn. "Under Gerstner, [IBM Global Services] would go out and sell their strategic capabilities and, by the way, sell hardware and software. And that's been great for the company."

Expressing a viewpoint shared by other analysts, Bittman described Gerstner as a "buttoned-down and intense" CEO who was exactly what IBM needed as it looked to cut costs and overhaul its internal structure. He also engineered acquisitions of vendors such as Lotus Development Corp. and Tivoli Systems Inc.

Gerstner came to IBM with no experience in the computing industry, having worked previously as CEO of RJR Nabisco Inc. and president of American Express Co. in New York. IBM said Gerstner will remain chairman until the end of the year, and he will then be given a 10-year consulting contract.

IBM last week also said that John M. Thompson, 59, will retire from his position as vice chairman effective Sept. 1. Thompson built up IBM's software group under Gerstner and is currently in charge of business and technology strategy.

– Lee Copeland

BRIEFS

HP/Compaq Deal Gets European OK . . .

Hewlett-Packard Co.'s planned acquisition of Compaq Computer Corp. cleared a big hurdle as the European Commission gave its approval to the deal following an antitrust-related review. The commission said the combined company would "not be in a position to increase prices" because of the competition that exists in the IT industry.

. . . While HP Says More Cuts Are Likely

HP said in a filing with the Securities and Exchange Commission that it will likely make more cutbacks, whether or not the Compaq acquisition goes through. The merged company would eliminate about 15,000 jobs for a 10% workforce cut, HP said. But it added that reductions "would also be expected if the proposed merger is not completed."

Server Shipments Up Slightly During 2001

Server vendors managed only a 1.8% increase in worldwide unit shipments last year compared with 2000 levels, the lowest growth rate since 1996, according to preliminary numbers released by Gartner Inc.'s San Jose-based Dataquest unit. In the U.S., shipments dropped 9.5%, from 1.9 million systems during 2000 to 1.7 million last year.

Short Takes

Telecommunications carrier GLOBAL CROSSING HOLDINGS LTD. filed for bankruptcy protection in New York and Bermuda, where it's based, and announced plans to sell ownership to new investors. . . . Peer-to-peer software vendor GROOVE NETWORKS INC. in Beverly, Mass., named Chuck Teubner, formerly chief operating officer at USINTERNETWORKING INC. in Annapolis, Md., to a similar position.

PATRICIA KEEFE

Quantum Leap

BILL GATES HAS SEEN the light and heard the alarms. As of his Jan. 15 state-of-the-union memo to employees, security, in the guise of "trustworthiness," has finally zoomed to the top of Microsoft's priorities. And *Computerworld* confirmed last week that the company has named Scott Charney, the former top cybercop for the Department of Justice, as its security czar.

Patricia Keefe is editorial director at *Computerworld*. You can contact her at patricia_keefe@computerworld.com.

This about-face is massively overdue at a company whose products are the laughingstock of the security community, considered too easy a target by experienced hackers and cause for much concern among uneasy corporations worried about their data assets.

Data security managers are constantly confronted with Microsoft products that have built-in security screw-ups. Vulnerabilities have been found in XP, UPnP, Internet Explorer, Outlook, Internet Information Server, Hotmail, Passport and, of course, every other version of Windows. Microsoft's TechNet site alone lists 60 security bulletins; since mid-October, four out of nine have been tagged "critical."

Both Gartner Inc. and the FBI's National Infrastructure Protection Center have publicly warned users away from specific Microsoft products or features. And now a coalition of consumer and privacy groups is asking the Federal Trade Commission to step in.

Yet Gates thinks Microsoft can "lead the industry to a whole new level of trustworthiness in computing." In our lifetime? Seriously, reaching that lofty goal will require a quantum leap in the security of Microsoft's products, in its ability to work with competitors and in regaining the trust of now-angry users. That won't happen overnight.

For one thing, Alan Paller, director of research at the SANS Institute, said Microsoft told him that its new devotion to security testing and training will primarily benefit its new products. Although that bodes well for the future, it's of no help to the tens of millions of Microsoft users who are now running the company's vulnerable applications on equally at-risk operating systems.

This is why it matters when a company assumes a monopoly position in a market: It doesn't have to care about current users. Who ya gonna call for replacement desktop applications? For most commercial and government accounts, there are no acceptable alternatives to Microsoft.

Paller and many users in various forums all insist that Microsoft's customers are disillusioned, angry and starting to act. Paller recounts how the deputy CIO of the Air Force stood up at a recent SANS seminar and told 200 people that Microsoft must make a quantum change in the way it delivers software to the government. He's quoted as saying, "It's costing us more to clean up after the messes than to buy the software in the first place, and we're willing to pay for it [to be done right]."

Charney needs to calm Microsoft's frustrated users, who don't want to hear from him about what happens after a security breach. They want to know what Microsoft is doing to prevent security problems. And they want help with the problems they've got now.

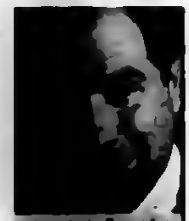
However Microsoft puts Gates' directive into action, it has to address existing weaknesses. A good place for the company to start is "Results, Not Resolutions: A Guide to Judging Microsoft's Security Progress" (*www.securityfocus.com/news/315*), by security experts Bruce Schneier and Adam Shostack. It's brimming with suggestions on where Microsoft can begin to secure its products and gain our trust.

PIMM FOX

Little Hope in Web Services

A FUNNY THING happened on the way to Web services: Someone forgot to mention that the XML protocols for SOAP and Web Services Description Language (WSDL) haven't been agreed to yet.

In fact, the standards body for Web services released a draft for a Web services container for J2EE only last month. And while there are positive things about SOAP and WSDL (such as message-passing between XML schemas), there's a great deal to be worked out regarding XML protocols for user interfaces and testing of Web services with back-end applications.



Pimm Fox is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

For example, in a Web services environment, an HTML Web page that includes a Java Server Page, such as a live stock ticker, must connect to a back-end application to retrieve data. If you wanted to test this connection before deployment, you would need virtualization technology from Interwoven Inc. But it's not a standard, either.

So far, Web services lack a single comprehensive way to manage their development, testing, deployment and upgrading.

IBM has chosen to tackle the issue piecemeal, defining standards on the business stack as needed, using WebSphere and Web application management tools.

Both IBM's and Interwoven's approaches leave a large hole to be filled for Web services management.

If you think portals are the solution, think again. Can you imagine exposing back-end applications to people entering data from a portal? Never mind security issues; you still need to organize and synchronize information between two different applications. And you can bet those applications are built with

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different vendor technology, bringing additional integration headaches.

Testing isn't just a technology problem; it's also an issue of reliability. A large enterprise can't jump into Web services without some assurance the back-end connections via XML and SOAP actually work.

Finally, few companies have structured their information repositories with Web services in mind. Document management, Web content management, digital asset management, media asset management and Web application management, as well as file systems for unstructured content, are all potential bottlenecks to rolling out Web services. Even if you lick the content management problem, you still face testing source databases for the transformation of tables to Web pages.

Some IT managers think Web services are a reality — they aren't. Some believe Web services mean interoperability — they don't. (.Net and J2EE are still slugging it out in the hearts and minds of developers.) Others see Web services as APIs — they aren't. Let's face it, you won't run subroutines, functions or class calls over the Net. And you're unlikely to be starting any Web services projects before these gaps in Web services are closed.

THORNTON MAY

Is It Time To Upgrade Vendor CEOs?

RUDY GIULIANI has it. Lincoln, FDR and Churchill had it. And Jeff Immelt, Jack Welch's successor at General Electric, has it: the ability to lead in difficult times.

The technology world is facing difficult times. Many in-the-trenches IT leaders are standing at a Dunkirk-like decision point: Do they retreat strategically, stand their ground in the face of a certain rout, or just surrender to the forces of darkness and despair? They wonder if vendor CEOs will come to their rescue by providing incentives to buy their products in a down economy. Observers of the broader tech scene wonder if the current slate of vendor CEOs is up to the challenge of leading in this economic climate.

So, is it time for a vendor CEO upgrade? Has the current cast of technology CEOs outlived its usefulness? Are these CEOs so grounded in times-are-good mind-sets that they can't be effective during an economic downturn?

In the "Managing the Information Resource" program at UCLA, in which most of the students are CIOs or their direct reports, professors ask students to describe the state of today's technology leadership. One European student responded, only partially tongue in cheek, that true American vendor CEO leaders are like snakes in Ireland: There are none.

Another set of students asked, Should the likenesses of Carly Fiorina, Bill Gates, Scott McNealy, Lou Gerstner and Larry Ellison be chiseled into a technology Mount Rushmore? Or should they be voted off the technology leadership island? (Answer: Only Gates goes.)

Thornton May is a senior member of Toffler Associates Inc. in Manchester, Mass., an executive advisory firm. Contact him at tmay@toffler.com.

The current cast of technology CEOs enjoyed a great ride. They were very successful during the boom times of the PC/client-server/network computing/Internet build-out. It remains to be seen how they will do in the you-have-to-do-more-than-ship-and-shout scene that describes today's IT marketplace.

The real question is, What should we ask of vendor CEOs in these difficult times? Is it enough for one of them to hunker down and try to save the ship he's steering? Or should we expect more in the way of technology statesmanship, looking beyond a company's interests to the overall good of technology? We have entered a new digital world, one that needs new frameworks and heroes. Who will these leaders be?

How should we evaluate technology CEOs? We need to jettison dysfunctional and misleading indicators such as stock-price multiples and quarterly sales figures. What should the scorecard for the next generation of technology CEOs look like?

What are good metrics of leadership today? One possible evaluation point is sincerity and motives. Do CEOs care about their customers, or do they just want their money?

Instead listening to CEOs' publicist-sculpted sound bites, we need to look beyond the words that come from their lips. Seek the meaning in the whole context in which a message occurs. To figure out what's really being said, we must ask, Who is saying what to whom, under what conditions and circumstances, and with what intent? Gates, for example, showed commendable leadership recently when he announced that Microsoft would undertake the quest to write more secure code.

In 1953, Charles Wilson, then president of GM, told a congressional hearing that "what was good for our country was good for General Motors." Given the dependence of our economy on IT, is the current group of vendor CEOs good enough for the country?

READERS' LETTERS

Taking Wrong Approach

INTERESTING — the IT industry is making the same mistake at the national level that we often make at the company level ["CEOs: Broadband Is National Priority," News, Jan. 28]. Instead of tech leaders pushing broadband to Congress, they should convince manufacturing, retail, banking and other leaders of its necessity, then enlist their aid in lobbying.

Barry Blauer
Technical manager
TEKsystems
Southfield, Mich.

Another Buzzword

I WONDER HOW many times in the past 10 years this story has been published with only the name (buzzword) for the technology and the names of the suppliers and users changed ["Web Services Projects Pose Challenges for IT Managers," News, Jan. 28]? I guess I'm getting too jaded, but my question is, Why would anyone with any experience in IT be surprised at the situation described?

Charlie Whitfield
Manager, IS
Sault Ste. Marie, Ontario

You Call This Progress?

PIMM FOX describes the modern look, all right ["The Modern Profile of the IT Pro," News Opinion, Jan. 21]. But what a waste. Older, seasoned veterans of the IT industry who understand the difference between what is new and what simply has a new name don't stand a chance. Think of that the next time something doesn't work correctly.

Deatra Davenport
Independent consultant
MicroComp
Chicago

Old-fashioned Security

LOW-COST IRISH airline Ryanair does positive passenger bag matching with nothing more complex than pencil and paper ["Wireless LANs: Trouble in the Air," Page One, Jan. 14]. It can do this because it won't accept or pass on baggage from other carriers and doesn't facilitate transfers between flights. This demonstrates that technology isn't always the answer, even though it does keep us computer professionals in a job.

Miles Thomas
Harpenden, England
milest@orange.net

IF MY BAG somehow goes where I don't, will the airlines be able to put it on an airplane to return it, or will the luggage be forever grounded? Perhaps the airlines will offer free tickets to owners of misdirected luggage to join their bags. I'd be hoping my bag went to Tahiti by mistake.

John Taylor
Vallejo, Calif.

The Root of the Problem

I AGREE THAT Windows 9x and ME don't have system protection ["Petreley's Law of Sysadmins," Knowledge Center, Jan. 21]. They were designed that way. If you want system protection, don't use them. Windows NT, 2000 and XP all have system protection. I haven't seen the latest figures, but that's a large percentage of Windows PCs. It's true that users may log in as administrator, but that's also true of all Unix systems, and I suspect that more Linux users log in as root than on all other Unix systems combined.

Phil Daley
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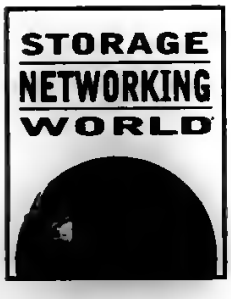

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White Paper

Interoperability: The 2002 Challenge

Addressing Interoperability in Heterogeneous Environments

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Interoperability: The 2002 Challenge

Addressing Interoperability in Heterogeneous Environments

Interoperability has been a hot topic of discussion and debate since the initial emergence of storage-area networks (SANs). Is it still an issue? Should interoperability concerns be perceived as a key barrier to successful SAN deployment? Current analysis says definitely no... with a little bit of yes.

By Barbara Goldworm, Independent Consultant

The early days of SANs were remarkably like the early days of LANs: The market was flooded by a plethora of products and vendors, hardware and software, hubs and switches, with a mind-boggling array of different features and functions. And like LANs, early SANs had tremendous interoperability issues. With products coming to market before standards, and hundreds of vendors jumping on the SANdwagon, it was a daunting task for users to dig through the hype, understand what they needed, and find products that actually talked to each other.

The result was that early SAN adopters put in a great deal of time and effort to get their SANs working. Interoperability was perhaps the number one issue for these early users. Only the brave dared to tackle the task, with lots of vendor involvement and frustration. The sentiment of the early adopters was that building your own SAN and trying to piece things together from various vendors was extremely difficult. Their advice: find a primary vendor (probably your storage vendor, your server vendor, or a trustworthy integrator) and stick with a homogeneous proven configuration.

These early struggles took a toll. In fact, in a recent survey of users at Storage Networking World, 79% of audience members reported that incompatibilities between vendors and their products have had a negative impact on their businesses (see Figure 1).

Progress on standards

In the past several years, standards began to emerge, vendors began to work together, and we began to see products with an initial level of interoperability. Numerous organizations undertook significant roles: the Storage Networking Industry Association (SNIA), the Fibre Channel Industry Association (FCIA); the Fibre Alliance; the National Committee for Information

Early adopters found that building your own SAN with pieces from various vendors was extremely difficult.

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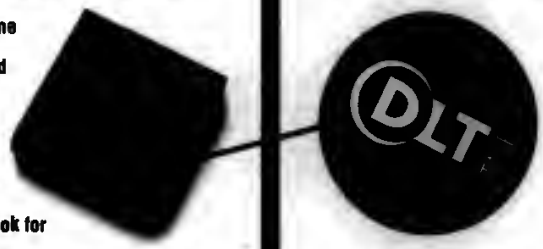

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The issue of standards tends to be one of the banes of the technology industry. Vendors constantly fight one another for their own vested interests, and the inevitable result for users is frustratingly slow progress.

Technology Standards (NCITS, formerly X3) technical committees (T10 for SCSI, and T11 for Fibre Channel working toward ANSI standards), and the Institute of Electrical and Electronics Engineers (IEEE), among others

The issue of standards tends to be one of the banes of our industry; vendors fight for their own vested interests, and the result is slow progress. A quotation on the T10 Technical Committee's Web site says, "If computers get too powerful, we can organize them into a committee, that will do them in." In the case of SANs, however, much standards related progress has been made, and the current level of SAN interoperability owes much of its progress to this work.

Labs and certifications

Another key reason for interoperability improvement is the amount of time, money, and effort that has been put into a variety of interoperability laboratories. With over 200 vendors in the networked storage space and the huge number of product combinations, vendors face an almost impossible testing challenge. Many major players have spent millions of dollars building test labs with products representing at least the most popular options for servers, storage arrays, tape libraries, hubs, switches, and bridges. These labs serve the vendors as internal test facilities for their own product groups, and as a proof-of concept lab for specific customer requirements.

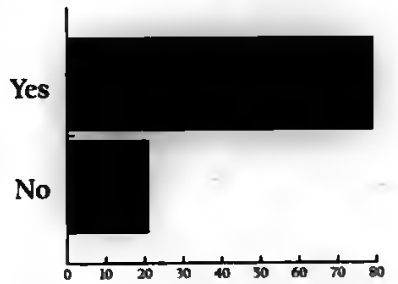
In addition to vendor labs, SNIA (in conjunction with Compaq Computer Corp.) has created the SNIA Technology Center, an independent interoperability test lab in Colorado Springs, for its member companies — vendors and users alike. Advisors to the center include analysts, integrators, and end users. The lab is a resource for the SNIA Interoperability Committee and is also intended to provide ongoing plug-fests, workshops, and training. Industry conferences such as Storage Networking World let users see the progress being made by visiting the Interoperability Lab onsite at the show. In a survey at the Oct. 2001 Storage Networking World, 78% of attendees said the lab was a valuable part of the overall education at the show.

The University of New Hampshire offers another vendor-neutral interoperability resource through its InterOperability Lab, known as IOL. The mission of the IOL is twofold:

- The first mission, externally focused, is to provide testing services for vendors to verify the interoperability and/or conformance of their products.

Figure 1:

Have incompatibilities between competing vendors' products had a negative impact on your business?



Source: A survey of attendees at the Oct. 2001 Storage Networking World conference

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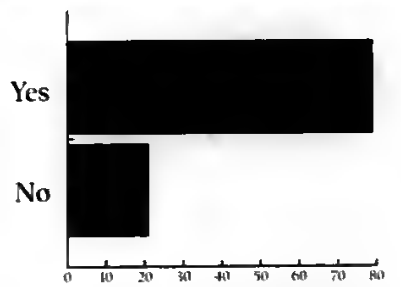


Source: A survey of attendees at the Oct. 2001 Storage Networking World conference

◆ The second mission is to provide educational and employment opportunities for qualified University of New Hampshire students

The IOL includes focused interest groups, called consortiums, in Fibre Channel, Gigabit Ethernet, iSCSI, IP v6, and several other communications protocols.

Independent certifications on compliance and interoperability have also helped users understand what works with what. The Fibre Channel Industry Alliance (FCIA) SANmark certification was the first stamp of approval offered, certifying a level of Fibre Channel compliance on individual products.

New forums

More recently, SNIA introduced a new forum called the Supported Solutions Forum (SSF) with two key goals. First, the SSF aims to build a registry of tested multivendor solutions that meet a defined set of criteria (such as including a minimum number of competitive vendor products, as well as functional and test criteria).

The initial SSF announcement included two approved solutions with six vendors; however, these solutions were approved with fairly severe restrictions (for example, zoning to maintain separation between competitive boxes). Some critics have asked whether this qualifies as real interoperability, but at the very least, it's certainly a step in the right direction.

Membership in SSF is up to 36 vendors, and new supported solutions are purportedly in the works. Users should hope the forum will now address tougher issues, including bigger and more complex configurations, additional vendors, software, tape, switch interoperability, and so on.

The second goal of the SSF is to address what is perhaps the bigger issue today in interoperability: cooperation among vendors in supporting multi-vendor storage networks. As an independent organization, SSF aims to help vendors work together to help users with their ongoing support issues, by assisting with cooperative support agreements, and by striving to establish a cooperative support community.

One key reason for interoperability improvement is the time, money, and effort that's been put into interoperability labs.

Where does all this leave us today? On the standards front, some say there are now too many, others argue that there is still a broad lack of agreement. Work continues, and while initial standards are now in place, there is still work being done to resolve more advanced interoperability issues (for example, FC-SW is approved and defines the standards for Fibre Channel Switches, while FC-SW2 is now in the approval process for defining the standards for interoperability between Fibre Switches).

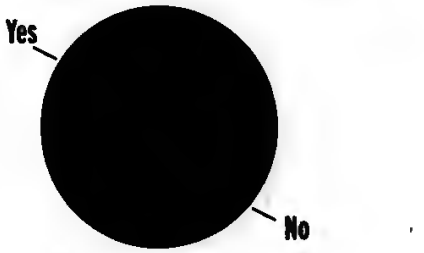
Taking root

Of course, once any standard is finalized, it takes time for it to be implemented. In terms of available products, interoperability testing has made great strides, and most lower-layer interoperability issues have been addressed (notable exceptions include ongoing conflicts and incompatibilities in the HBA arena).

There's been enough progress to date so that the general issue of interoperability and lack of standards has

Figure 2:

Should the industry provide vendor-independent certification in storage management technologies?



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dropped significantly from its place near the top of the list of SAN implementation barriers, according to most users. (Cost and a lack of skilled workers now top the list of impediments, many users agree.)

Moving up the stack

With interoperability issues at the lower layers now being largely addressed, the key challenge in true interoperability is in moving up the stack to address issues such as storage management. Again, standards work comes into play here. At the IETF, efforts are under way in SNMP MIB compliance. Also, work on the Common Information Model (CIM) is being done at the Distributed Management Task Force (DMTF). Because one of the key drivers for SANs is improved storage management, interoperability at the management level is critical. Underscoring this need, 81% of Storage Networking World attendees said they want the industry to provide vendor-independent certification in storage management technologies (see Figure 2).

Another example of moving up the stack comes in the area of virtualization. Virtualization offers great benefits today within individual areas, but until SANs offer complete virtualization regardless of product, vendor, and platform, the full promise is not fulfilled. Moving up the stack to these higher levels of interoperability involves more complexity, but will truly deliver on the promise of networked storage.

Emerging technologies

Thus far, the SAN limelight and the interoperability discussion have focused mostly on Fibre Channel. In fact, some attribute the continuing negative focus on interoperability to Fibre Channel critics who seek to discredit Fibre Channel SANs.

If, as many believe, lower layer interoperability is no longer an issue with Fibre Channel, one interesting question is what will happen in the future with the emerging technologies of iSCSI, iFCP, FCIP, Infiniband, DAFS, TCP offload, the merging of SAN and NAS, and other technologies as they evolve. For example, while some argue that IP storage has already conquered interoperability since it uses IP, there are still many challenges to address with IP storage, as well as its coexistence with Fibre Channel.

As with most changing technologies, the real world will most likely be a hybrid of all these options, involving interoperability issues within technologies as well as across them. And so the saga continues...

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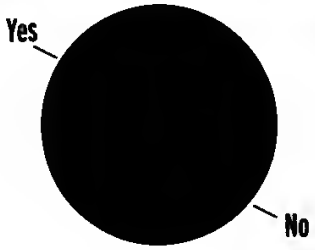

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About the author

Barb Goldworm is an independent consultant with over 20 years' experience in the computer industry. She has held technical, marketing, industry analyst and senior management positions with Novell, StorageTek, IBM, and several successful startup ventures. She is a frequent speaker at industry conferences worldwide, and was the creator and track chair for the Networked Storage track at Networld+Interop.

Goldworm is also an instructor of SAN Solutions and Technologies classes through NGAI (www.NGAI.com) and chairs the Publishing Advisory Board for Computer Networking for Macmillan/Pearson Education/SAMS Publishing. She can be reached at barbgoldworm@earthlink.net.

Question & Answer

[illegible] but vendors [illegible]

Brian Cobb is vice president of systems engineering at Fannie Mae, the largest provider of funds for home mortgages in the U.S. and one of the largest financial services corporations in the world. His organization is responsible for the engineering and support of all Fannie Mae system platforms — a large, heterogeneous environment spanning the agency's two primary data centers in the metropolitan Washington, D.C., area.

Before joining Fannie Mae in 2000, Cobb was director of information technology at Primark's Financial Information Division in Bethesda, Md., and director of information and technology services at Hagler Bailly Inc. in Arlington, Va. During a recent conversation, he discussed the most important interoperability issues facing Fannie Mae and other users.

Q Describe your storage networking infrastructure at Fannie Mae.

A COBB: We use storage-area networking in a couple of areas. We have a SAN in place to support our backup and restore activities. So we have a fabric which connects the backup media servers. Smaller systems send their data over a Gigabit Ethernet network to these media servers on the [illegible] and they in turn send the data to our tape drives.

We have some big tape silos that the media servers write to. This is how we back up our small servers. Our large systems — what we call SAN class — include our big database servers and file-servers. If they're over a certain size, they are considered SAN class, and we tie those directly into the fabric and write directly over Fibre Channel to the tape silos.

Q How has this infrastructure been changing during your time at Fannie Mae, and how do you expect it to change in the future?

A COBB: We went into production this year, so we're basically converting systems over to this now. We started to our data warehouse environment with the backup SAN, and more changes will come as we migrate other systems from our previous backup architecture to this new one. So I expect the changes for the next year or two to be related to growth. The core-edge architecture we selected for our SAN fabric infrastructure allows us to scale up by adding pairs of switches, and that is what we will do.

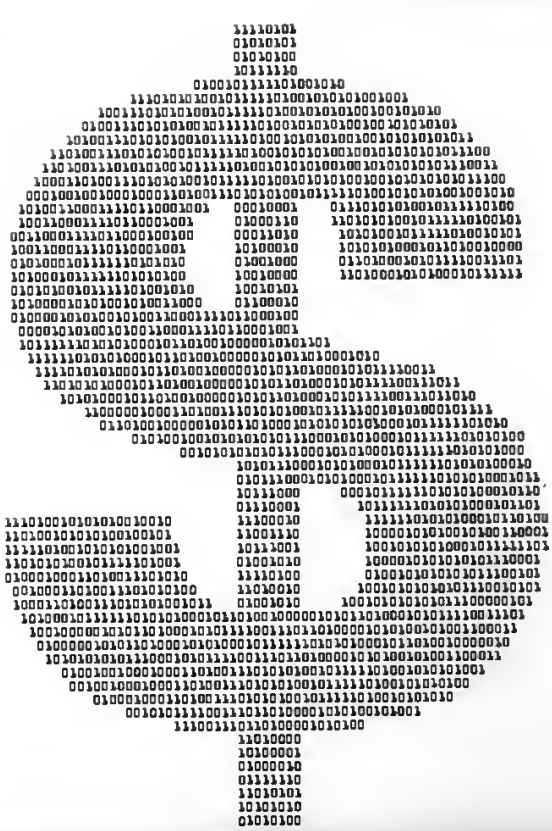
Q All hype aside, what is the current state of storage networking interoperability?

A COBB: Interoperability is pretty good in terms of basic functionality. But when you talk about more advanced things like SAN management tools and virtualization, I think [illegible] still [illegible] there [in the future]. [illegible] management [illegible] really manage a large [illegible] environment — that can handle [illegible] multiple types of servers and mixed-vendor storage all in the same fabric. And virtualization is a layer beyond that.

But in terms of interoperability with the basic stuff, meaning having disk drives and storage arrays talk to a fabric, which talks to servers on the other side, that capability is generally there. In the case of our backup SAN, we had a problem with a high-end Unix platform. In order to fix it, we've been working through some interoperability issues around HBA drivers and SAN-switch firmware revisions. But we worked with the vendors, and we have a working solution.

Q How troubled are you by the gap between the basic interoperability that works, and the virtualization that is not reality?

A COBB: I'm actually not yet troubled by it. I think the migration to some of these bleeding-edge technologies like virtualization will be slow as customers [illegible] out, see the [illegible] and [opine to] under-



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stand everything about them. Fannie Mae is not bleeding-edge; we're risk-averse. We're more into using proven technologies, so we wouldn't adopt anything like virtualization until we saw that it was mature.

There seems to be a dichotomy between what we hear from vendors and what users are really doing. Vendors talk about the ability to make heterogeneous networks, while a lot of users say they're just trying to keep this thing uniform and homogeneous. Where is the reality between those extremes?

COBB: I think it's in the middle. As I said, we have a SAN for the backup capability. And in that environment, we are heterogeneous, mixing all kinds of systems. On the disk storage side, we develop our disk SANs by business area. In those cases, we may be heterogeneous on the server side, but we're not mixing different vendors' storage yet. So I think both things are happening.

Truly, we are moving toward being fully heterogeneous on the storage side. A lot of the [vendor] companies we deal with are getting the message. As a result, we periodically hear about vendors teaming up to work on open standards issues.

When you talk to your peers, other users, what are their complaints about interoperability?

COBB: The point that you raised. There's a difference between users who've done it and users who haven't. When we started out, we went around and we talked to everybody. We went to all the vendors, we went to their interoperability labs, and we went to their engineering headquarters and talked to their designers. We were told that if we were going to build it, we should definitely be homogeneous.

There is still a lot of push like that from the sales side. In our environment, we're very large, heterogeneous, and complex. Homogeneous just doesn't work for us because that's not how we are, so we have to wade through all that hype and get down to really what it can do.

Customers who haven't implemented yet may be shying away from some of the rhetoric that they hear. But other customers who have done implementations agree that, as has been the case with Fannie Mae, you have to build test environments every time you deploy. We have a test environment that we can test everything on, including functionality, throughput, and configurations.

We make sure we can change switch firmware as we need to. We have the same kinds of servers in the test environment, including HBA firmware, and the same on the storage side. Customers have to be willing to do this testing in a full environment that mimics production.

How would you assess the progress by vendors toward interoperability, and how can they do more?

COBB: They should do more. They should be more aggressive. Vendors partner up and make these announcements about working together, but I'd like to see more hard, cold interoperability certifications out there. I'd like to see multiple storage vendors coming out and certifying solutions all together.

Do you view things like the Storage Networking Industry Association's Supported Solutions Forum as a step in the right direction, but not a big enough step?

COBB: I think it is a step in the right direction. We need that, and we need big customers forcing the issue. Some of the conferences like Storage Networking World are helpful, but sometimes I think that big customer alliances might also be a big help.

Users stand to benefit most from standards, but it's often hard to get them involved. Have you had any involvement in the standards development process?

COBB: I haven't been involved in the development of standards, but I have been considering it. I think I could make a difference if I did. The

vendors I work with have been responsive — some more than others — and so far, we've been able to get our issues resolved at Fannie Mae. But I do think participation on standards boards would be beneficial.

It's hard to get users involved, because they're off taking care of their day-to-day activities. But on the flip side, we've clearly seen the gains this technology has provided in terms of helping us reduce our costs and increase our efficiency. That's why from my standpoint, it's worth getting involved with some of these standards.

Q: It sounds as though you believe substantial interoperability gains have been realized.

COBB: As I said, the basic stuff is there. SCSI over Fibre Channel, all that good stuff works today, so I can use switches now and build SANs that allow me to share storage on the back end across multiple servers. That works today, there is no doubt about it. I think that switch technology has matured so that there's a long mean time between failure. The management side is where there is a lack of standards.

Your storage arrays don't all talk the same language, so I don't have a tool that I can use to look at and administer heterogeneous storage arrays all at the same time. Those types of things are not there. Reporting is another area where I don't have a tool that can give me reporting across all environments on, for example, utilization.

Q: We seem to go through cycles. Twenty years ago, we went through this with LANs, and with data and voice communications integration. At the time, it seemed like we were in the dark old days of computing. Now it seems like we're going through that again as we strive to reach some kind of standardized level of interoperability. It's almost as though in some ways, we haven't moved ahead at all.

COBB: Take networks, for example. And this came up in a lot of our conversations with server and storage vendors. Most LANs don't include a mix of switches and routers. People who build LANs get their switches and routers from the same vendor. So even though TCP/IP and Ethernet are mature standards, you still end up building a homogeneous network infrastructure. At any rate, clearly, interoperability is improving.

Q: How satisfied are you by the role being played by SNIA, and how much bigger can that role be?

COBB: Besides driving standards, I would like them to go out and get more customers involved. They should bring them together separately, and also get them involved in standards development, because customers are the ones the vendors have to ultimately please.

Q: I think SNIA feels sheepish that they haven't done that, but I think they also feel as though it's very hard to get users to participate because as you said, they have their regular jobs — and the standards process is so slow.

COBB: From my own perspective, I think it's valuable for users to get involved. The more user involvement we have, the more things we'll get.

Q: What advice do you have for users who are implementing storage networks?

COBB: Do your research. Talk to all the vendors. Go to their labs. See what they're doing. In the case of a large, heterogeneous environment like we have, we opted to go with an integrator to help us build a fabric. They also helped us to get all the server and storage vendors on the same page.

We use a company named CNT, Computer Network Technology. We do data replication in our mainframe environment using some of their products, so CNT's already in the storage networking business with us, but they don't care about a particular server or storage option.

They just like to do the integration piece, so we turned to them and said, "Hey, we want to do this," and we brought them on-board to help us come up with the architecture and the right way to build our SAN infrastructure.

Wired for Success

Hitachi storage system provides instant ROI for Focal Communications

Case Study

Focal Communications Corp. needed a storage system that would offer the company 24/7 availability, ease of management, and the ability to scale as its data grows. As a national phone company, Chicago-based Focal needs to support a vast amount of reporting for its corporate clients. This means keeping track of millions of customer records, a job that would cause pronounced infrastructure problems if left unaddressed.

As senior manager of Focal's data center in Arlington Heights, Ill., Philip Brown experienced first-hand how the company's storage infrastructure was growing out of control. With more customers expecting instantaneous access to billing information and service records, storage bottlenecks became increasingly common — and storage management ever more challenging.

When Brown began his search for a solution, Focal had approximately 100 Windows and Sun Solaris servers, many using direct-attached storage (DAS). That meant 100 points of administration, 100 points of power, and 100 points of connectivity had to be managed. "We were able to look across our environment and see up to 300GB of available storage," Brown says. "The problem was, we couldn't utilize that storage beyond 30GB because it was so dispersed and fragmented across servers."

And Focal's rapid growth promised to exacerbate these woes. Brown considered continuing the company's DAS approach, but this would impose greater congestion problems, and would do nothing to alleviate repeated storage hardware costs. With all internal avenues exhausted, Focal recognized it needed an enterprise storage solution.

The assessment

Before making a decision, Brown worked with outside consultants and created a matrix of top storage vendors. He wanted Hitachi Data Systems included in the assessment because of Hitachi's reputation as a quality player in the storage arena. When they compared providers side by side, Brown and a team of Focal system administrators focused on criteria such as manageability, scalability, performance, professional services, and cost.

After reviewing Focal's storage requirements, Brown determined that only a very highly available storage solution — one that would scale seamlessly in both performance and capacity — could be trusted with the company's most critical data. In addition, the solution had to accommodate 8TB of existing storage.

"That's when we decided on the Hitachi Lightning 9960," Brown says. Hitachi's revolutionary Hi-Star switch actually prevents bottlenecks and disruption in service by offering 64 internal paths; if one fails, 63 working paths remain. This impressed Brown's team.

Moreover, the Lightning 9960 didn't just eliminate bottlenecks and scale to meet increased demand; it delivered peace of mind by way of Hi-Track remote monitoring. Hi-Track's call-home feature ensures non-disruptive service by detecting and addressing potential system problems before they occur.

In the end, Brown and his team were most impressed by the features and benefits of the Lightning 9960. Besides offering high availability and scalability, the Lightning 9960 delivers built-in redundancy, leading software, and storage-area network (SAN) capability. Brown was also reassured to learn that Hitachi Data

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Chicago-based Focal needs to support a vast amount of reporting for its corporate clients. This means keeping track of millions of customer records, a job that would certainly cause pronounced infrastructure problems if left unaddressed.

Systems maintains close technical alliances with leading storage management software providers like Veritas.

At this point, Brown decided not only to select the Lightning 9960, but to pursue a long term relationship with Hitachi Data Systems

Foresight

IT managers are under increasing pressure to choose the best storage solution for their business. Focal Communications is absolutely convinced it made the right choice. Brown compared the costs of purchasing 2TB of additional storage for the Lightning 9960 storage system, and purchasing a similarly equipped array from another vendor. The result: the Lightning 9960 saved Focal $160,000. "It was a better designed machine and saved us money with our first additional storage purchase," Brown says.

The growing national communications provider also discovered that based on its current configuration of the Lightning 9960, Focal could maximize the number of storage frames on the Lightning 9960 and realize a 27TB storage capacity. "We wanted to come up with a storage solution that would scale to meet our needs," Brown says. "The Lightning 9960 easily met that need."

With the implementation of the Lightning 9960, Focal no longer worries that its storage infrastructure lacks the capability to scale as its quantity of data grows. The company has since added billing, account information, and data warehousing and provisioning data to its Lightning 9960 solution. With plans to connect more production servers, Focal has already added another 2TB of capacity and plans to add more storage in the near future. Not bad for a company that had built its first 8TB of DAS on Sun and Compaq platforms. "We now have a lot of confidence in Hitachi Data Systems and the Lightning 9960," Brown says. "Fourteen months after our Hitachi storage decision, Sun identified the Lightning 9960 as their enterprise storage solution of choice. I think we showed some good foresight."

Partner for the future

Named one of the nation's fastest growing technology companies by Bloomberg Personal Finance, Focal Communications' future plans include leveraging the SAN connectivity of the Lightning 9960 to further boost return on investment. The company also plans to implement an enterprise backup solution that will employ Brocade Silkworm 2800 switches and a StorageTek L700 Tape Library.

These switches will allow the communications provider to take data from the Lightning 9960 and copy to tape using Veritas NetBackup over Fibre Channel. Another money-saving proposition. "Rather than maintaining an independent tape and storage solution for the UNIX side and the Windows side, both will use our new enterprise backup solution," explains Brown. For added assurance, Focal is also preparing to mirror its storage solution at a remote data center in Ohio using both Hitachi TrueCopy and ShadowImage data-replication software.

Case Study

With the SAN capabilities of the Lightning 9960, Focal no longer wastes time searching for data on dispersed storage systems, and saves money by reducing expenditures on additional frames and connections. "Our data center is now laid out with Unix servers on one side and Windows on the other," Brown says. "In the middle, we have a SAN powered by the Lightning 9960 that connects these environments. As a result, our infrastructure is much more efficient and robust than before."

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THIS WEEK

GRID POWER

Grid computing is an emerging variety of distributed computing used to tie into vast networks of underutilized CPU and storage capacity. It could someday help brokerages settle stock trades on the fly and enable pharmaceutical firms to run supercomputer-type tests for cancer and AIDS drugs. PAGE 28

CONSULTING CRUNCH

Unlike during previous recessions that led to extra work, independent IT consultants are finding it hard to maintain a steady stream of projects during the current ecooomic slump. Find out what some contractors are doing to keep their businesses humming. PAGE 30

WEB SITE PAYOFF

Companies like Staples and Steelcase are comparing online and offline sales to determine whether investments in their online efforts are paying dividends. PAGE 34

CAREER ADVISER

Fran Quittel offers guidance to a Unix developer who's considering a switch to the Mac OS X market, a Cisco Certified Network Associate who has no work experience and a Web designer who's scouting out the Chicago market. PAGE 36

PAUL A. STRASSMANN

Still a Loser's Game

MORE THAN SIX YEARS AGO in this column ["Outsourcing: A Game for Losers," Aug. 21, 1995], I demonstrated that the real reason corporations were awarding massive IT outsourcing contracts was simple: Just about every firm that was outsourcing IT was in financial trouble.

That column continues to be cited in books and reports that have addressed the viability of IT outsourcing. Meanwhile, I continue to field inquiries from CIOs and a few chief financial officers on whether the original findings remain valid. My curiosity led me to check oo some of the largest recent multiyear contracts for firms that outsourced more than half their computing resources.

Detailed financial information for 1996 through 2000 was available for eight such firms: AT&T, Aventis, Du Pont, Nortel, Rolls-Royce, Sainsbury, Textroo and Xerox. Outsourcing deals of troubled firms such as Enron, which had a huge IT outsourcing contract, were excluded.

Each of the eight corporations that have outsourced most of their IT also delivered declining returns on shareholder equity (ROE).

The average ROE for the entire group declined from 18.2% in 1996 to 2.5% in 2000. That 2.5% is below the prime lending rate, suggesting that many shareholders would have been better off since 1996 investing in U.S. Treasury bonds rather than holding onto their shares. Such dismal performance is generally considered a reliable indicator of an organization in trouble.

It's also remarkable that three of the firms that were reasonably profitable in 1996 subsequeotly showed rapidly declining ROEs that turned negative in 2000 — a sign of financial failure.

The Importance of Successful Outsourcing

According to IDC, global IT outsourcing (which doesn't include application services, consulting services, business process management, network management and desktop outsourcing) will grow from a $56 billion industry in 2000 to an estimated $100 billion in 2005.

The compound growth rate for such services will exceed 12%, which is far greater than the maximum projected growth rate of total corporate IT budgets of 5% per year.

Since the U.S. accounts for about half of global IT spending and tends to favor outsourcing more than the rest of the world, the projected growth rate of outsourcing contracts by U.S. companies exceeds 12%. This rapid increase suggests that the IT scene is likely to be plagued by two new perils:

- Outsourcing services firms are likely to suffer unforeseen losses, quite possibly from contract disputes, after taking over damaged IT departments from troubled firms.
- Corporations with poor ROEs could be exposed to unwelcome risks if a major IT support failure occurs during the perilous transition from internal to outsourced operations, just when there is little room for error in systems management.

My observation that failing firms increasingly resort to outsourcing as one of their remedies doesn't prove that the outsourcing itself is the cause of their troubles. The direct connection between outsourcing and financial difficulties can't be demonstrated unless one has access to a great deal of confidential informatioo about things such as changes in market share, investment write-offs, the effects of competitive actions or loss of patent protection.

Nevertheless, I continue to find that major outsourcing moves can be a telling symptom of a company in trouble, as I have shown in previous *Computerworld* columns regarding General Motors [June 5, 2000], Xerox [Nov. 6, 2000] and J.P. Morgan [May 7, 2001].

PAUL A. STRASSMANN has always favored outsourcing of IT functions that deliver measurable financial improvements. Contact him at [redacted].

My conclusions about the declining shareholder returns that are associated with large outsourcing contracts would be less convincing if I could show that a large number of firms had dramatically improved their ROE before they divested most of their IT functions. But so far, despite my best efforts, I have been unable to find such data.

So I stand by my 1995 findings that firms with declining returns on shareholder equity should pursue IT outsourcing only if they can demonstrate provable financial gains that improve otherwise unfavorable financial conditions.

Companies are beginning to use complex adaptive systems to plot future business scenarios. By Kathleen Melymuka

IMAGINE BEING ABLE to look into the future to see how today's policies and initiatives will affect your company's profitability and competitive position 10 years down the road. That's the vision a community of scientists in Santa Fe, N.M., is trying to provide through the business adaptation of a new type of computer-based simulation.

Nourished by the brainpower of Los Alamos National Laboratory and the Santa Fe Institute, a complexity think tank, more than two dozen start-ups have been using supercomputers to experiment with simulations based on complex adaptive system theory. Businesses have been using computer simulations for years, but complex adaptive system modeling is different. Traditional models start with assumptions from historical data; complex adaptive systems start with the world as it is and track the results moving forward.

This kind of simulation might have useful applications for all kinds of industries, says Alexander Linden, an analyst at Gartner Inc.'s Frankfurt office. Financial services companies could use it to simulate capital markets, he says. Pharmaceutical and chemical companies could model the effects of different chemicals on organisms. The aerospace industry could use it to create materials that perform under stress. Airlines could learn to optimally balance cargo for the smoothest possible ride, and so on.

Recently, several Santa Fe-based companies have brought the software for these simulations into the world of business, where early applications hint at their potential.

Insurance

In the early 1990s, after Hurricane Andrew led to catastrophic losses estimated at $25 billion in the U.S., property and casualty insurers were forced to rethink their approach to risk management. Some Santa Fe scientists began working with big players in the insurance industry such as Swiss Reinsurance Co. in Zurich and Marsh and McLennan Cos. in New York. "Losses were so staggering that it shook the industry to its core," says Terry Dunn, president of Assuratech Inc., the Santa Fe-based commercial enterprise that grew out of the collaboration.

Rather than try to better predict the likelihood of a hurricane, he says, the group looked at the real make-or-break equation: How do an insurance company's business plan, investments and capital flows respond when a hurricane hits? The simulator they developed models the environment within which the company operates in order to determine optimum capital strategies for surviving catastrophic losses.

The simulator features a "playing field" and "agents." The playing field is the natural environment in which catastrophes happen as well as the financial environment of capital flows. The agents are customers, capital markets, primary insurers, reinsurers and regulators. Agents interact through customer choices, contracts, partnerships and regulations. Finally, there are physical and financial wild cards such as hurricanes, earthquakes and recessions.

Assuratech creates a virtual copy of the business and the business universe. The model includes everything known about competitors, customers and the regulatory environment as well as the company's investment portfolio and operating strategies: markets served, preference for profit or market share, desired investment growth rates and efficiency of capital, adjusted cost of capital, and so on.

When a "universe" of data has been programmed, the simulator, which can run on any high-end laptop, drops in random physical and financial catastrophes and tracks capital flows through the company on a quarterly basis for a virtual 10-year period to see how the organization fares compared with its competitors. The company's strategies can be adjusted to see how changes would affect the outcome.

For example, if the simulation shows that investing in gold futures seems more profitable than investing in stocks, the company can shift its capital to that segment and see how the change affects the bottom line. "The key here is that you get to model your world before you commit your resources," says Dunn.

"The business-as-usual model for an insurer is to project the future based on experience from history," says John Schienle, director of the California Housing Loan Insurance Fund, a Sacramento-based state agency that issues mortgage loans for low- and moderate-income people. The agency has been using the simulator for nearly three years.

"Assuratech's model lets us see what would result from various management actions based on simulated events," says Schienle. The agency can

Characteristics of Complex Adaptive Systems

If you want to understand complex adaptive systems, think football:

Elements of a simulation	Elements of a football game
■ Defined space	■ Football field
■ Interacting agents or objects that are intelligent and adaptive (a few dozen to a few hundred thousand)	■ Players, coaches and referees interact within a set of rules, and they adapt based on what works
■ Agents have local information only and know what only some agents are doing	■ Players see what others in their field of vision are doing, but not those behind them
■ Some random events such as a natural disaster or economic recession	■ Wild cards such as weather and injuries that can affect the outcome

What

then adjust its strategies accordingly, he explains.

Without the simulator, Schienle says, this would be impossible. "There are so many factors involved in trying to model an industry, it's complex beyond what a human can imagine," he says.

Supply Chain Modeling

At Procter & Gamble Co. (P&G) in Cincinnati, Larry Kellam has been using complex adaptive system theory for two years in an effort to improve P&G's supply chain dynamics. "We're trying to move to a consumer-driven supply network," says Kellam, director of business-to-business supply chain innovation. "We are all about taking time, cost and cash out of supply chain to add value to the consumer."

As part of this effort, P&G has been working with Santa Fe-based BiosGroup Inc., a consulting and complexity modeling firm, to look at how different approaches might improve its supply chain efficiency.

BiosGroup developed models of P&G's supply chain and then tried new policies and approaches virtually. For instance, what if P&G relaxed its policies that delivery trucks had to be full and that pallets stacking products within the trucks could have only one type of item each? What if orders were checked and redirected at the last minute rather than based on customer projections? What if supermarkets and other customers shared information about planned product promotions that might change their supply needs?

AT A GLANCE

Practical Scenarios

- **Insurance:** risk exposure
- **Finance:** capital market behavior
- **Airlines:** aircraft load balancing, passenger management
- **Manufacturing:** supply chain optimization
- **Retail:** consumer buying patterns
- **Aerospace, automotive:** aerodynamics
- **Defense:** scenario planning

By testing various scenarios, BiosGroup found several hundred million dollars in potential savings, and real-world tests with customers confirmed those findings. "None of these ideas was new," says Stuart Kauffman, president of BiosGroup. "They just couldn't quantify how important they were before."

P&G has embarked on a massive project in partnership with BiosGroup, software developer i2 Technologies Inc. in Dallas, MIT's Auto-ID Center and other organizations to find practical applications for adaptive theory. The initiatives include the following:

- Developing "smart" replenishment software for integration into P&G's enterprise resource planning system.
- Replacing universal product codes with electronic smart tags.
- Overhauling infrastructure to allow real-time demand signals between stores and manufacturing facilities.
- Embedding complex adaptive theory into a distribution resource planning tool to get inventory to where it's really needed regardless of what the purchase orders say.

It's a big job, and Kellam acknowledges that the results might still be five years away. "But if we do it right, we think we can take about half of all of our inventory out of the system, on the order of 20% of our cost and at least half of the time," he says.

Are the possibilities of complexity modeling worth exploring? "Absolutely!" says Gartner's Linden. "There's always an increase in accuracy if you deploy specialists like those companies near Santa Fe."

But the one thing they can't predict, he says, is the effect of complexity modeling on your bottom line. "You need to have the right data and know whether the prediction accuracy is really related to added business value," he explains. "Even if you do increase accuracy, the amount you invest may not justify the return. . . . Nobody can tell you, and that may be why the industry is not growing as quickly as some people expected."

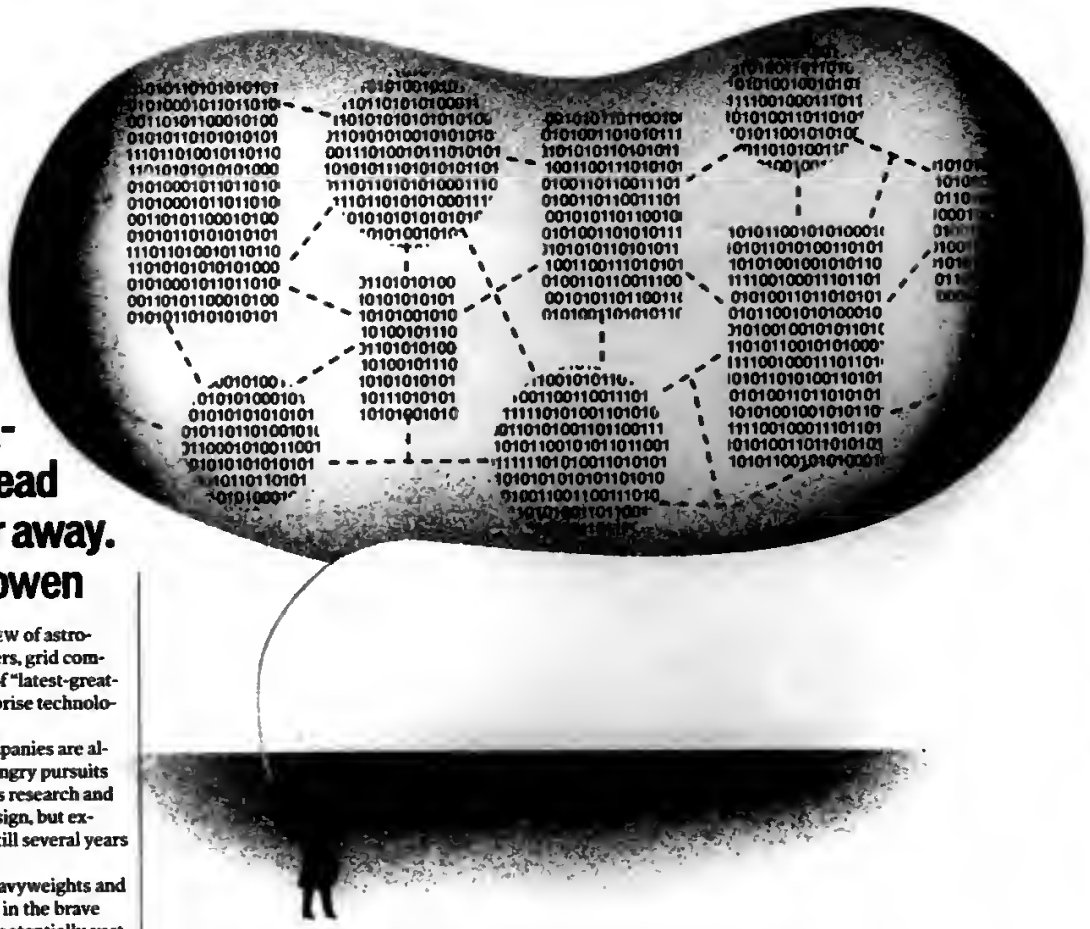
Quick Link While much of the Santa Fe complexity community is building virtual worlds, find out how Strategic Analytics Inc. focuses on dismantling the real world.
www.computerworld.com/q?28588

Plotti

A GRID STRATE

Some pioneers are already using grids in data- and CPU-hungry pursuits such as life sciences R&D and engineering and design, but experts say widespread business use is far away.

By Ted Smalley Bowen



UNTIL RECENTLY THE PURVIEW of astrophysicists and drug designers, grid computing is a prime example of "latest-greatest syndrome" in the enterprise technology business.

Some bleeding-edge companies are already using grids in data- and CPU-hungry pursuits such as media production, life sciences research and development, and engineering and design, but experts say widespread business use is still several years off and not without caveats.

Nonetheless, computer industry heavyweights and assorted start-ups are staking out turf in the brave new world of computational grids — potentially vast agglomerations of computing muscle and data that promise to fuel e-commerce and enterprise applications while also serving scientific and technical needs.

Grid computing emerged as a means for scientific researchers to tackle complex problems, the calculation and processing of which would overwhelm even the most powerful supercomputers. Whether they scrape together CPU cycles from idle workstations or harness multiple supercomputers, grids provide the framework for assembling sophisticated, ultrapowerful virtual computers.

These assemblages of distributed resources are coordinated by software that handles the differences among computer operating systems and manages things like scheduling and security. Grids can make available a wide range of CPU cycles, storage and other resources.

Grid Alert

Grids have generally been used in business for some time in the form of search engine farms and systems handling bioinformatics and media special effects, among other applications, notes Nick Gall, an analyst at Meta Group Inc. in Stamford, Conn.

The grid rubric covers a wide range of private and public systems, some under the control of single

entities and others run by coalitions. To date, many grids have taken shape in the academic and government research communities, some on a nationwide scale. Others are internal corporate setups.

Some of the more high-profile grids include government projects such as the National Science Foundation's National Technology Grid, NASA's Information Power Grid and the European Union's DataGrid. There are also private corporate efforts in the aerospace, pharmaceutical and automotive industries.

Grids could set the stage for a more adaptable and viable second wave of application service providers (ASP) and their acronymic cousins, xSPs. They could also form the basis of more flexible and powerful intranets and extranets.

Part of the attraction is the prospect of putting the right mix of CPU power, data and bandwidth at users' disposal as they need it, whether that's supplied through a private, highly secure grid configuration or a loosely coupled publicly available grid.

The prospect of plugging into grids instead of laying out huge sums of money to upgrade internal systems has an obvious appeal to companies trying to weather a down market.

"[Given] the paucity of skilled people out there and the cost of training, there will be a progressive desire to [create a] coagulation of technology in a way to really leverage the skills that do exist and still provide the level of service users are really looking for," says Dave Turek, vice president of emerging technologies at IBM.

In addition to technology heavyweights such as IBM, Sun Microsystems Inc. and Hewlett-Packard Co., smaller players such as Markham, Ontario-based Platform Computing Corp., San Diego-based Entropia Inc. and Austin, Texas-based United Devices Inc. are pushing various enterprise and vertical-industry grid tools as well.

But don't look for grids to overlay the enterprise for at least a few more years, because the infrastructure tools and business adaptations are still taking shape, according to observers.

"Full-blown grid computing is still about two to three years out, and five years from being a big impact," says Gall.

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EGY

To that end, the business models for delivering, supporting and charging for grid services and applications also have yet to jell. And while it might be tempting to view grids as the one hammer for all your nails, the trick for IT managers is to identify if and where grids are appropriate. Work remains on such key functions as load balancing, cluster management, resource identification and sharing and database integration, as well as ensuring a useful degree of standardization, according to observers.

Gridlock

Indeed, the transition won't be automatic, since R&D labs have different computing needs than corporate IT centers.

"A grid as an object that scavenges spare cycles from someplace is less useful to the enterprise than a grid as a mechanism for locating data resources," says Robert Hollebeek, a physics professor and director of the National Scalable Cluster Project at the University of Pennsylvania in Philadelphia.

As a first step, IT managers would be wise to ask, "Are they really in an enterprise that could benefit from better communication and sharing of resources in a wide-area networked setting? If so, they could start adopting some authentication mechanisms so they can participate in a grid with trusted entities," Hollebeek advises.

"In the context where it's hard to predict how much you'll need to ramp up your systems and what you'll need to integrate, grid computing provides some flexibility," says Paul Kearney, director of bioinformatics at Caprion Pharmaceuticals Inc. in Montreal. "It's not clear to me that someone would choose to migrate to grid computing when their data is more homogeneous and integration of technology moves at a slower rate."

Plus, computers strung together in a distributed fashion would be virtually useless for many low-latency applications, which would be bogged down by the Internet's communications delays.

"I don't find the concept of lashing computers together with grid middleware to do very large calculations appealing. Many of the compute-intensive applications of interest to us have stringent latency and bandwidth demands," says Thom Dunning, director of the North Carolina Supercomputing Center in Research Triangle Park and vice president of high-performance computing and communications for its parent organization, MCNC. CPU-hungry enterprise applications fall into this category.

Finding a Fit

The appropriateness of grid computing depends on whether businesses "have problems that need significant computational resources and can be distributed," says Alex Bangs, chief technology officer at Entelos Inc., a Menlo Park, Calif.-based bioinformatics company. "Do they really need to sit on some giant 64-processor machine or some big mainframe, or can they be broken up into small pieces and those small pieces be crunched on a smaller machine, whether that machine is sitting in a server room somewhere or whether that machine is some idle cycles from somebody's desktop?"

Entelos develops complex computer models of human diseases and virtual laboratory software for researching the diseases and developing treatments. The company works with pharmaceutical giants such as Aventis, Pfizer Inc. and AstraZeneca PLC, whose vast intranets and countless desktops make them ideal grid computing users. Both Entelos and the pharmaceutical companies use grid computing to fuel the heavy-duty processing needed to run the virtual experiments.

"We're doing a specialized kind of modeling. In general, people do all kinds of models — there's financial models, and even the data mining is a lot of times based on a model," Bangs says. "What scaling up to grid computing means is being able to look at many, many more variations of those models."

Players in other industries such as automotive design are also beginning to harness the potential of grid computing.

"We're working on the complete aerodynamics of the race car," says Kevin Colburn, team leader for computational fluid dynamics at the West McLaren Mercedes Formula One racing team in Woking, U.K. "We're concentrating on typical kinds of aerospace things like the front and rear wings of the car. But we also analyze suspension components for their angle and orientation, [as well as] radiator flow, air box, you name it."

More important, grids "allowed us to do the same amount of work quicker, and then allowed us to research other areas of the car that we may not have done previously because we didn't have the compute capability," Colburn says.

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Quick Link

To learn more about the security challenges facing grid computing, go to:
www.computerworld.com/q?20598

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Grid Crossing

The following are some vertical industries and potential applications for CPU and storage-intensive grid networks:

FINANCIAL SERVICES: Brokerages could use them to clear and settle trades quickly instead of relying on lengthy batch-processing runs; investment banks could also tap into them to run risk analyses. Insurers could use them to try to predict the potential cost outlays of a major earthquake or other disasters for commercial and residential customer policies.

HEALTH CARE: Pharmaceuticals could use them to run CPU-intensive calculations on experimental drugs that are being developed.

AUTOMOTIVE: Automakers could use grids to run simulated tests on the aerodynamics of vehicles that are being developed.

AEROSPACE AND DEFENSE: Big aerospace and defense contractors could use grids to conduct simulated stress tests on fighter jets or space shuttles.

To that end, the business models for delivering, supporting and charging for grid services and applications also have yet to jell. And while it might be tempting to view grids as the one hammer for all your nails, the trick for IT managers is to identify if and where grids are appropriate. Work remains on such key functions as load balancing, cluster management, resource identification and sharing and database integration, as well as ensuring a useful degree of standardization, according to observers.

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Quick Link: To learn more about the security challenges facing grid computing, go to: www.computerworld.com/s/725536

Consultants IN CRISIS

Normally, the sky's the limit when it comes to consulting opportunities in a bad labor market. Not this year. Merely surviving will be a challenge, and many will find themselves earning less or doing other things. By Leslie Jaye Goff

ACCORDING TO CONVENTIONAL wisdom, IT consultants should have a stellar year, due to the downward-spiraling economy. But looking out over the next 12 months, 2002 is shaping up to be a highly unconventional year.

Traditionally, independent consultants and consulting agencies are in high demand during economic downturns. After periods of massive layoffs, companies reluctant to add full-time staffers to their payrolls have turned to contract employees to fill the gaps on IT projects.

But despite economic conditions that have been good for IT consultants in the past, many consultants and agencies say they fear a drastic downturn in their business this year.

"Business is deadly slow — slower than I've ever seen it," says Beverly Nadelson, vice president of All Star Consulting Inc. in San Francisco. "Generally, around this time of year, our clients are calling about their upcoming projects. But I'm hearing none of the usual ooise about anything new, and that's not a good sign."

The fortunate consultants had gigs that saw them through the end of 2001, but as they started to look for first-quarter work in December and January, many came up dry. While some independent consultants and agencies say they cautiously hope to generate at least as much revenue as they did last year, none of them expect the blockbuster growth they took for granted in the late 1990s.

For many, the slowdown started last year in response to continuing dot-com closures, the slumping stock market and corporate cut-

backs. While a July-to-August slowdown is business as usual for most consultants, some say the economic instability that followed the events of Sept. 11 quashed the usual fall rebound.

Greg Hollings, president of Visionary Computer Consulting Inc. in Lakewood, Colo., says that the terrorist attacks on the U.S. decimated his prospects. He expects his business to be down by 30% this year.

"I was just totally floored by how much of an effect [Sept. 11] had on my business," says Hollings, a Java applications developer who spent much of 2000 and 2001 working with dot-coms and telecommunications firms. With the high-tech industry downturn, "it was already getting quieter, but it seemed that was just the last nail in the coffin," he says. "A lot of clients just shut their doors and stopped talking. It has been flat since then."

Even consultants who are getting inquiries from potential clients express concern about client companies' ability to pay for IT consulting services. "There's just no money," Nadelson says.

David Randolph, an independent consultant in Plano, Texas, says he's getting the usual number of calls from prospective clients that he typically gets at the beginning of a new calendar year. But he has also seen clients' budgets dry up. His company, Prairie Trail Software Inc., generated more volume in 2001 than in 2000, but its revenue was down because many clients couldn't pay their bills.

"Many of the checks we received bounced," explains Randolph. "I'd love to say we've worked out payment plans with them, but we keep checking with their banks, and they still don't have the money."

Good Times Ahead?

Despite a rough first quarter, many in the IT consulting community remain steadfastly optimistic about a second- or third-quarter upswing in both the economy and their prospects.

Independent consultants acknowledge that the days of juggling three or four simultaneous projects at high rates are behind them for now. But they say they expect that pent-up demand for mission-critical projects will finally loosen clients' purse strings and that the market forces that have traditionally favored consultants will come back into play.

"Any company that wants to gain a competitive advantage and has the wherewithal to do so will use consultants," says Randy Hayman, president and co-owner of IT services firm PureIce Inc. in Eagan, Minn. "They won't want to take the payroll risk of adding full-time employees until they see some certainty in their future. And that's why I continue to be upbeat on 2002."

Consultants and agencies say they expect companies to go forward with technology initiatives that generate new business, such as customer loyalty programs and other customer relationship management applications. Another key area of consulting activity should be systems that streamline business processes and cut costs, such as supply chain management systems, they say.

The health care industry's mandate to comply with the Health Insurance Portability and Accountability Act of 1996 may also create consulting opportunities, consultants and agencies say. With those initiatives already consuming IT staff resources, health care providers may turn to consultants for other projects.

The key to getting a foot in the door on these types of projects this year, consultants and agencies explain, will be promoting your business expertise and customer service ethic rather than specific technical skills. "You need to change your frame of mind," says Randolph. "Show customers that you'll do everything you can to resolve a business problem for them."

Consultants can also no longer rely on receiving the high rates they've commanded during the past few years, particularly in the traditionally higher-paying markets. In the San Francisco Bay area, for example, the rates clients are willing to pay have gone down by 20% to 25%, says Nadelson.

"Rates are completely client-driven, so you have to figure out what a client wants to pay and go from there," she explains. "We have one project manager who was getting $100 an hour, and now the most that a client will pay for project management is $60 an hour. The rates are going down to where they were five to seven years ago."

Although the outlook is uncertain, seasoned consultants are riding out the downturn with an eye on the long haul. They're taking the requisite steps to generate new business — networking with colleagues, repositioning their marketing messages and evaluating new specialties to pursue — but they also say that they're giving the market ample time to recover before they hit the panic button.

Christine Hokans, president of CMH Systems Inc. in Belmont, Calif., counts herself among the lucky consultants who had a steady project through the end of last year. She says she's giving herself three months to line up her next gig. At that point, Hokans plans to evaluate looking for a staff position, although she's loath to consider it.

In the meantime, Hokans says she's using her free time to seek IT volunteer opportunities and attend user group and professional association meetings for face-to-face networking. She's also eliminating extraneous expenditures.

"My husband and I eat out a lot, and we made a New Year's resolution that we'll cook all but one night a week," Hokans says. "So I've got all my cookbooks out. And no more Starbucks every day."

Instead of panicking, Hokans and other consultants say they're trying to view their newfound freedom as the silver lining of the economic slowdown. They say they're spending more time with their families, purging the stacks of papers and magazines that clutter their offices, getting back to the gym and pursuing other activities that they haven't had the spare time to enjoy.

"One of reasons I got into consulting was to have more control over my personal life, and I've had a lot of personal time in the last quarter," Hollings says. "I'm thoroughly enjoying that. I'm an irrepressible optimist, or I never would have become a consultant to begin with."

Goff is a freelance writer in New York. Contact her at lgoff@ix.netcom.com.

Get Back To Work!

Job-searching advice for unemployed IT consultants:

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3. Prepare to adjust your rates.
4. Be open to agencies and recruiters.
5. Volunteer your services to a nonprofit group.
6. Consider forming your own consulting practice.
7. Maintain a positive attitude.

IT HIRING 2002

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Calculating Web Site Payoff

Forget counting page hits. Compare online and off-line sales to determine true ROI. By John Webster

DESPITE last year's dot-com disasters, the Web continues to be a part of virtually every company's marketing strategy. The question isn't whether or not to have an online presence; it's how to tell whether — and by how much — the Internet increases market share and fattens the bottom line.

The problem is that most companies have no idea how to accurately measure return on investment when it comes to their Web sites. Counting hits and monitoring visitor behavior have become de rigueur, but oeither one answers the thorny question of how much a company earns — or saves — by marketing on the Web.

Meanwhile, even in the midst of a down economy, companies continue to invest money in their Web sites. But now top managers are pushing harder than they once did for proof that the sites are more than glitzy money pits, according to Lisa Melsted, an analyst at The Yankee Group in Boston.

The average company budget allocation for a Web site is about $500,000 annually, according to a survey of 200 companies that The Yankee Group conducted in August 2001. While overall expenditures have likely come down somewhat over the past several months due to cutbacks and layoffs, Web site maintenance is still a large expenditure, Melsted says.

Comparing Web sales with sales generated by other channels is an important ROI metric that can help a company determine how online activities stack up against overall business goals. At $10.7 billion Staples Inc. in Framingham, Mass., the value of a customer is based io part oo how many channels he uses to buy products. That means analyzing sales generated over the Web, at retail stores and from the catalog.

"We focus on integrating sales data across all our channels to create metrics that refer to the lifetime value of the customer," says Mike Ragunas, chief technology officer at the office supplies retailer. "We've found that in terms of sales, a three-channel shopper is worth 4.5 times that of a retail-ooly shopper."

Two Channels Are Better Than One

Similarly, St. Petersburg, Fla.-based HSN LP, a $1.8 billioo multichannel retailer best known for its Home Sbopping Network, has found that customers who shop both online and from television spend 26% more than those who shop through a single channel.

If a company experiences an increase in Web site visitors that doeso't result in increased sales, something is wrong, says Eileeo Raphael, manager of Steelcase.com, the online arm of $3.9 billioo office furniture maker Steelcase Inc. in Grand Rapids, Mich.

After launching the company's first Web site in 1995, Raphael watched site traffic double every year; but the number of sales leads didn't double.

Steelcase learned from customer feedback that visitors to the site were frustrated by its design and felt that it didn't provide enough informatioo to place orders. "When we decided to relaunch, we were getting 110,000 to 120,000 visitors per month, so there was a tremendous opportunity to build our customer base," Raphael says.

Now, Steelcase looks at both revenue and cost savings to measure the ROI of its relaunched Web site. For example, a salesperson at one of the company's 800 outlets might earn $75,000 per year. If Steelcase.com can provide product information without getting a salespersoo involved, it saves an hour of the salespersoo's time, or about $36.

"If we can save one hour of time for a dealer salesperson every week, that adds up to millions of dollars per year in people's time," says Raphael.

Countrywide Credit Industries Inc., a $2 billioo financial services company based in Calabasas, Calif., is also seeing increased sales online as a result of a Web site overhaul. The company redesigned its site two years ago based on customer feedback and Web site performance.

Countrywide's IT group built software that lets the company track "events," such as how many people fill out loan applications online and how many applications result in loans. To do that, Countrywide had to integrate the Web site with back-end databases and enterprise applications. This process also lets the company more easily measure Web site activity in terms of its overall business objectives, says Larry Gentry, vice president of e-commerce.

For example, Countrywide now knows that its Web sites account for 48% of overall loan funding, up from only 5% two years ago.

Also, providing services such as electronic statements and online rate calculations via the Web site has yielded cost savings. Previously, Countrywide provided those services at a higher cost via mail and fax. "The immediate ROI is cost reduction. Now that we put those services online, customers get the information sooner and we get the cost savings," says Gentry.

The bottom line is that instead of poring over reams of data, IT's time is better spent developing ROI measures that can show how well the company's Web channel is performing compared with other sales channels, says Bill Gassman, an analyst at Gartner Group Inc. in Stamford, Conn. ◗

Webster is a freelance writer in Providence, R.I., who frequently covers technology. Contact him at johnwebster1@earthlink.net.

Excuses, Excuses

Companies say they don't calculate ROI because:

■ It's not worth the effort.	44%
■ They lack firm data.	32%
■ Senior management doesn't require it.	28%
■ They lack necessary financial experience.	13%
■ It takes too long.	4%

Base: 362 e-commerce managers; multiple responses allowed.

SOURCE IDC FRAMINGHAM MASS APRIL 2001

Ask & Answer

Instead of looking only at revenue and site visits to determine Web site ROI, consider the following:

- Is the Web site creating efficiencies across the business that you didn't have before?
- Do you provide enough information online to cut down on the number of calls to your toll-free number?
- Will e-mail marketing save money on direct mail costs?

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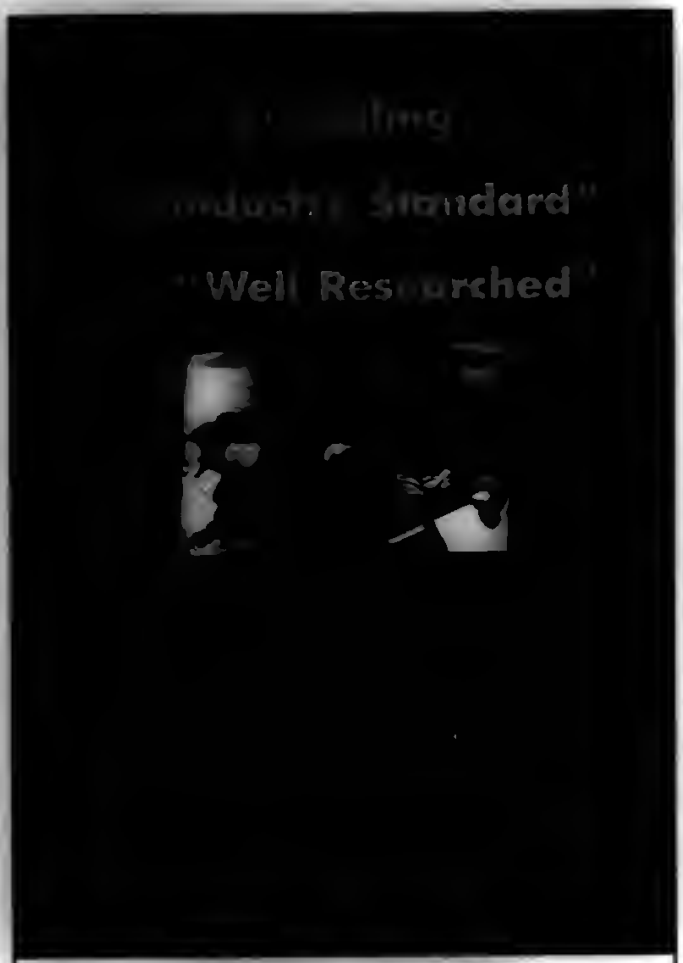

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Dear Career Adviser:

I'm a Unix application developer looking for work. Even in this market, I would like to do something interesting, and I have thought about working on the new Mac OS X. Are companies hiring in this area?

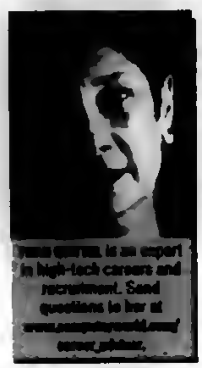
— HUNTING HARD

Dear Hunting:

While opinions vary regarding how quickly OS X development experience will get you new work, being able to work across multiple operating systems is a definite plus. "Interest in developing for this market has ratcheted up significantly now vs. even six months ago," says Doug Hill, senior project leader at Smart Technologies Inc., a developer of meeting productivity technology in Calgary, Alberta.

That's partly because Apple Computer Inc. is now shipping machines with OS X as the default operating system. Plus, there's a native version of Microsoft Office that runs oo OS X, not to mention better documentation to bolster OS X application development.

Getting hired for OS X development work is possible, particularly if you have a Unix or Java background and want to develop applications for markets such as education, graphics, video editing or games or work on hardware and peripherals.



Career Adviser, is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Dear Career Adviser:

I recently became a Cisco Certified Network Associate. Other than this credential, I have little to no formal computer training. I have been trying to get a job now for close to two months, but apparently nobody wants someone with no experience, even though I aced my Cisco exam. What can I do?

— NO TAKERS

Dear No:

In today's world, any training or certification needs to be backed up with work experience. If you can't find a job because you have no experience, work as an apprentice, even if it's in your spare time for no pay at a small business or for a nonprofit group. That's the suggestion of Mark Skvarna, deputy superintendent of Baldwin Park Unified School District in Baldwin Park, Calif., who created the district's Teaching Technology Program.

Dear Career Adviser:

After spending a year as a Cobol programmer and another year as a help desk analyst, I recently completed a program in Web design at a tech school, with straight A's. I know HTML, JavaScript, Photoshop, Dreamweaver and Flash, and I want to land a job as a Web designer. What are my chances, particularly in Chicago?

— NEWLY MINTED

Dear Minted:

Although you have a recent degree as a Web designer, you're actually a day late and a dollar short for the Chicago graphics market, says Jeff Pace, president of WebGroup LLC, a recruiting firm with offices in Chicago and Detroit. While your Cobol experience could be beneficial for Web development because of your coding and structured programming background, your actual experience is lacking. Plus, if you go after Web designer jobs, you're competing against more experienced creative talent who are also vying for Chicago jobs.

More practical approaches would include returning to help desk or end-user support work in a corporate environment or doing outsourced call center support for a vendor and then trying to move up within the company, says Pace. With a four-year degree in this market, you might earn $30,000 per year or more supporting intricate software.

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THIS WEEK

THIN IS IN

There are a number of reasons for IT to move to server-based applications feeding thin-client systems. They can reduce equipment maintenance and upgrade costs, provide fewer end-user problems and offer better control over applications and data. PAGE 40

DAVID PLUNKERT

AGILE AND VERSATILE

A new breed of "lightweight" programming systems, such as extreme programming, emphasizes rapid iteration and interaction with users. Such systems are proving to be effective for smaller, faster projects. PAGE 42

QUICKSTUDY

PHP is an open-source language designed for creating Web applications. Devotees say it's exceptionally easy to learn and use, and one corporate IT manager says it has helped cut his IT costs sixfold. Find out more in this week's primer. PAGE 46

SECURITY JOURNAL

From newly discovered router vulnerabilities to viruses traveling in on Secure Sockets Layer sessions, Vince Tuesday has his hands full in the new year. This means that long-range planning moves to the back burner. PAGE 48

NICHOLAS PETRELEY

Baseball Cap Linux

AT THE TIME OF THIS WRITING, rumors are flying that AOL Time Warner may purchase Red Hat Inc. I've read many opinions and speculations on the motives behind such a move, but nobody seems to know yet why AOL Time Warner would be interested in Red Hat. I know at least one reason: AOL Time Warner should buy Red Hat to make its version of Linux the basis for an inexpensive all-purpose home console.

Like Microsoft, AOL Time Warner would have to take a loss on every box. But the company could make up for the loss in monthly access fees, not to mention royalties on the game and other software developer kit licenses. AOL Time Warner customers would upgrade in a minute if they thought it meant using its software on a box that doesn't crash all the time. Throw in Star Office and a few other goodies, and it could make most home computers obsolete.

Assuming this is what AOL Time Warner is after, then I can see why Red Hat is the ideal target. AOL users don't strike me as the kind of people who know or care much about Linux. If they have heard of Linux at all, it's probably because they've heard of Red Hat. So while the public relations benefits may be very small, AOL Time Warner would get more public relations brownie points from Red Hat than from any other Linux distribution.

Red Hat Linux is also the top pick because it has weathered the recession better than any other distribution. This allowed Red Hat to keep much of its original talent intact, while other companies have had to lay off some of their best and brightest.

A Red Hat purchase would also make it less likely that the open-source community would protest AOL Time Warner's entrance into the Linux market. Not everyone likes Red Hat, but most people agree that it's dead serious about keeping the open-source model pure. As long as the purchase doesn't precipitate an employee exodus from Red Hat, the open-source community isn't likely to assume that AOL Time Warner will try to poison Red Hat Linux with proprietary extensions. Considering the state of the economy, AOL Time Warner can be reasonably confident that there won't be an exodus unless it really botches the transition.

The worst-case scenario is that AOL Time Warner would cause Red Hat to stagnate and fade into irrelevance. So what? Linux will live on even if the company kills Red Hat outright. Red Hat Linux is just a collection of open-source code that anyone can modify, improve and sell. So plenty of commercial Linux distributors (not to mention Linux advocates such as IBM) could leverage Red Hat's existing market share and code base by repackaging and selling an improved version of Red Hat under another name. MandrakeSoft and Caldera built their businesses on that model and faltered only after they strayed too far from it.

Here's why IT people should hope AOL Time Warner is planning to build an appliance and that it succeeds: It would be a grand proof of concept for Linux as a platform for the average Joe. It would turn Red Hat Linux into Baseball Cap Linux, if you will.

If AOL Time Warner customers began to replace their PCs with AOL Time Warner appliances, they may not know or care that they're running Linux. But you can bet savvy IT administrators would notice. These AOL Time Warner boxes would prove that Linux has all the frills of Windows minus the crashes and cost. After that, it's a no-brainer to deploy similar desktop appliances at work in order to save bundles of cash. And if AOL Time Warner doesn't want to create such appliances, I'm sure IBM and others would.

Once Linux started to penetrate the desktop, there would be no stopping it. The reason is security. It's far easier to secure a Linux or any Unix-based system against intruders, viruses and Trojan horses than it is to secure a Windows box. I've heard from many readers who decided to adopt Linux for this reason and are glad they did. But not nearly enough people have expended the effort to see that Linux is easier to secure than Windows.

If AOL Time Warner makes Linux mainstream, more people could finally find out for themselves. And for anyone who has been hit with the Melissa or I Love You viruses, there would be no turning back.

NICHOLAS PETRELEY is a computer consultant and author in Hayward, Calif. He can be reached at [illegible]

Thinfrastructure

Overview

Many enterprises are moving away from PCs to server-based applications feeding thin-client systems. Compared with desktop PC systems, modern thin-client software can reduce equipment maintenance and upgrade costs, introduce fewer end-user problems and offer better control of applications and data. Thin-client systems provide fast access to Windows applications over low-bandwidth connections. But there are drawbacks: You need bigger, more sophisticated back-end servers, and more users are affected by network outages. Moreover, thin clients won't do for compute-intensive or graphics-intensive applications, and there's no off-line access.

By Robert L. Mitchell

TECH CHECK
THIN-CLIENT COMPUTING

CALL IT THIN-CLIENT, server-centric computing or virtual user interface software. Products like Citrix Systems Inc.'s MetaFrame, Microsoft Corp.'s Terminal Services and Tarantella Inc.'s Tarantella Enterprise, traditionally found in corporate settings, send only user interface and keystroke data between client and back-end systems.

Using proprietary protocols, these products offer faster access to back-office applications on low-bandwidth wide-area networks while reducing infrastructure and administration costs. So far, IT departments have been reluctant to deploy this technology to internal LAN clients or to a wider range of applications, but that could change as thin-client systems become more attractive for enterprise use.

SOURCE: IDC, 2001

The newest systems make client software a standard browser plug-in, extending the hardware that's supported. On the back end, administrators can configure the systems to let users access applications though an intranet Web page. Thin-client software sports sophisticated load-balancing features to optimize back-end server performance. Server farms can span data centers, allowing uninterrupted computing during a system upgrade or a catastrophic failure. Most systems now support Secure Sockets Layer encryption.

But thin clients don't fit every situation. They can't support high-end graphics applications, and power users may need their own desktop systems.

Companies with thin-client systems can save money by avoiding PC upgrades, but that's just part of potential savings, says Dan Kusnetsky, an analyst at IDC in Framingham, Mass. In a typical computing implementation, "staffing is 50% to 75% of the three-year cost," he says. Such savings can more than off-set increased costs of servers and software, Kusnetsky says.

John Bolz, systems architect at Wells Fargo & Co. in San Francisco, agrees but says it's hard to get top management to see beyond initial costs: "You can talk [total cost of ownership] till the cows come home, but the cost of deploying servers appears to a lot of eyes as a significant expense."

CASE STUDIES

WORLD FOOD PROGRAM, ROME

Feeding Off The System

WHO THEY ARE: A United Nations agency delivering food to underdeveloped areas

GOAL: Let relief workers in Pakistan and other countries access its ERP system in Rome to directly coordinate food shipments.

CHALLENGE: The system must work in areas with poor connections or over VSAT links, and with no local support.

STRATEGY: Install MetaFrame XP on Windows 2000 servers in Rome for access to an SAP AG system; install a browser-based client on thin-client devices and ship them to remote locations.

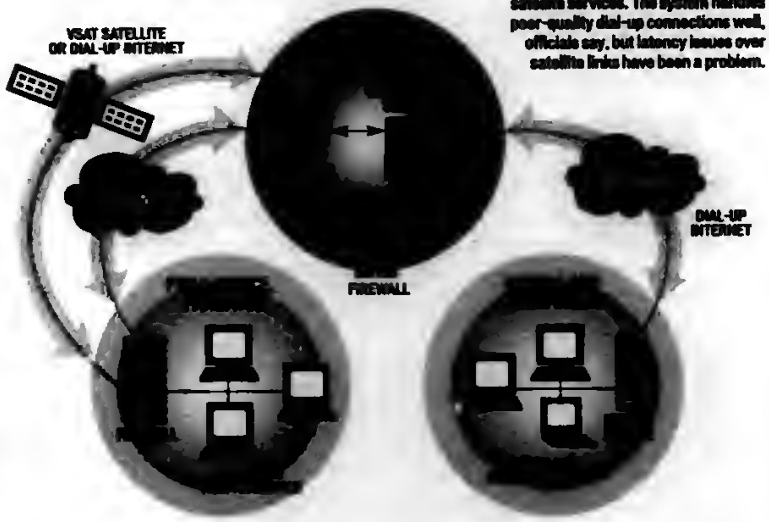
COMMENTS: In places like Islamabad, where the World Food Program opened an office in November 2001 to coordinate Afghanistan relief efforts, "connectivity is a challenge, and support for complex applications is difficult to achieve," says Ole Ofstedal, acting chief of the systems group.

ISSUES: World Food Program CIO Ken Herman likes Citrix Systems Inc.'s MetaFrame enough to deploy 30 Wyse Technology Inc. Windows thin terminals at headquarters for SAP training, which he says cost 75% less than PCs. But the 600 PCs at headquarters still run the standard SAP client. "As CIO, it's not clear to me that I'll replace traditional desktops, given that you have to scale the back end so high," he says.

PAYOFF: After receiving preconfigured thin-client PCs and basic instructions, users were able to access the ERP system in Rome. "We got the Pakistan operation up and running in two hours," says Ofstedal. The systems are easily reconfigured to use a backup VSAT connection, although latency created some connection problems. The World Food Program has since rolled out the system to 300 users in 29 other countries.

How the World Food Program Delivers the Goods

Workers in remote field offices connect to the agency's ERP system using a browser-based Citrix thin client that can run efficiently over the low-bandwidth connections provided by its dial-up ISP or satellite services. The system handles poor-quality dial-up connections well, officials say, but latency issues over satellite links have been a problem.



Thin Clients for Tough Times

Q&A Excerpts from a conversation with Steve Kaplan, a vice president and general manager at Houston-based Citrix reseller Vector ESP Inc. and co-author of the book *Citrix Metaframe for Windows Terminal Services: The Official Guide* (McGraw Hill, 2000).

Is it time to reconsider thin-client computing for its economic benefits? This is the way to deploy Windows 2000 without touching the PCs. One thing that people usually miss is they don't think about the remote offices and how they're going to be able to eliminate the infrastructure out there.

What's the most common mistake made when assessing the business benefits of thin-client computing? Putting in this infrastructure but then only using it for a couple of applications. If you're going to do it, do it for the whole desktop. Sure, you can make exceptions, but for the most part, go thin client everywhere.

What's holding back wider adoption of thin-client computing? I think it's people who rise up through IT decision-making because of an ability to manage perceived risk. And the most scary thing to a CIO is thousands of users screaming at them. It's fear. It's job security.

Is Thin Client Enterprise-Ready?

ANALYSIS RECENT IMPROVEMENTS in thin-client software were enough to convince Wells Fargo & Co. to buy a 10,000-user license for Citrix Systems Inc.'s MetaFrame XP. "We are geographically dispersed, and keeping servers and workstations up to date is becoming a very expensive proposition," says John Bolz, vice president and systems architect at Wells Fargo in San Francisco.

FACTORS TO CONSIDER

Ole Oftedal, the World Food Program's acting chief of the systems group, is deploying thin clients at more than 300 locations worldwide and considers thin-client systems a perfect fit for complex enterprise applications like SAP.

"[SAP is] a dirty application, from a systems point of view," he says. "It's tough to maintain and difficult to deploy over a wide-area network." Oftedal rejected a Web-enabled version of SAP because it offered fewer features and a different user interface.

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ONLINE EXCLUSIVE: [illegible]

Quick Link

WELLS FARGO & CO., SAN FRANCISCO

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Thinfrastructure

Overview

Many enterprises are moving away from PCs to server-based applications feeding thin-client systems. Compared with desktop PC systems, modern thin-client software can reduce equipment maintenance and upgrade costs, introduce fewer end-user problems and offer better control of applications and data. Thin-client systems provide fast access to Windows applications over low-bandwidth connections. But there are drawbacks: You need bigger, more sophisticated back-end servers, and more users are affected by network outages. Moreover, thin clients won't do for compute-intensive or graphics-intensive applications, and there's no off-line access.

By Robert L. Mitchell

TECH CHECK
THIN-CLIENT COMPUTING

CALL IT THIN-CLIENT, server-centric computing or virtual user interface software. Products like Citrix Systems Inc.'s MetaFrame, Microsoft Corp.'s Terminal Services and Tarantella Inc.'s Tarantella Enterprise, traditionally found in corporate settings, send only user interface and keystroke data between client and back-end systems.

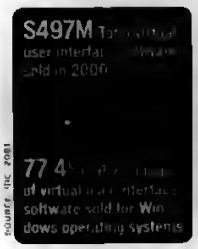
Using proprietary protocols, these products offer faster access to back-office applications on low-bandwidth wide-area networks while reducing infrastructure and administration costs. So far, IT departments have been reluctant to deploy this technology to internal LAN clients or to a wider range of applications, but that could change as thin-client systems become more attractive for enterprise use.

The newest systems make client software a standard browser plug-in, extending the hardware that's supported. On the back end, administrators can configure the systems to let users access applications though an intranet Web page. Thin-client software sports sophisticated load-balancing features to optimize back-end server performance. Server farms can span data centers, allowing uninterrupted computing during a system upgrade or a catastrophic failure. Most systems now support Secure Sockets Layer encryption.

But thin clients don't fit every situation. They can't support high-end graphics applications, and power users may need their own desktop systems.

Companies with thin-client systems can save money by avoiding PC upgrades, but that's just part of potential savings, says Dan Kusnetsky, an analyst at IDC in Framingham, Mass. In a typical computing implementation, "staffing is 50% to 75% of the three-year cost," he says. Such savings can more than off-set increased costs of servers and software, Kusnetsky says.

John Bolz, systems architect at Wells Fargo & Co. in San Francisco, agrees but says it's hard to get top management to see beyond initial costs: "You can talk [total cost of ownership] till the cows come home, but the cost of deploying servers appears to a lot of eyes as a significant expense."



CASE STUDIES

WORLD FOOD PROGRAM, ROME

Feeding Off The System

WHO THEY ARE: A United Nations agency delivering food to underdeveloped areas

GOAL: Let relief workers in Pakistan and other countries access its ERP system in Rome to directly coordinate food shipments.

CHALLENGE: The system must work in areas with poor connections or over VSAT links, and with no local support.

STRATEGY: Install MetaFrame XP on Windows 2000 servers in Rome for access to an SAP AG system; install a browser-based client on thin-client devices and ship them to remote locations.

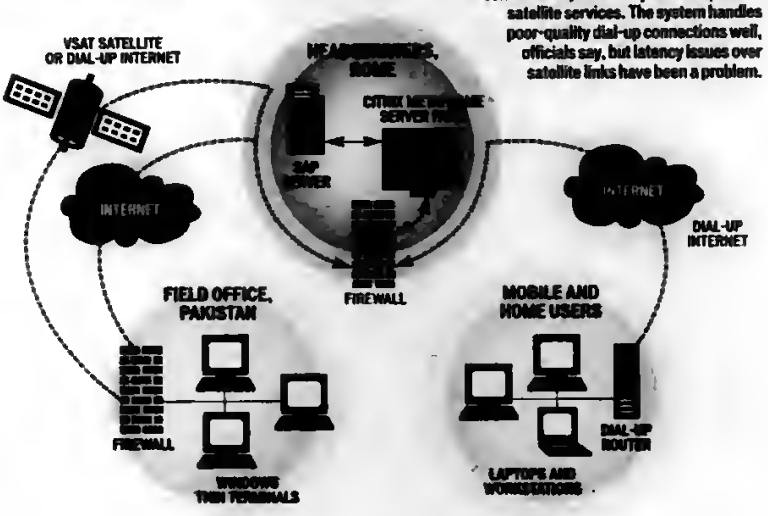
COMMENTS: In places like Islamabad, where the World Food Program opened an office in November 2001 to coordinate Afghanistan relief efforts, "connectivity is a challenge, and support for complex applications is difficult to achieve," says Ole Oftedal, acting chief of the systems group

ISSUES: World Food Program CIO Ken Herman likes Citrix Systems Inc.'s MetaFrame enough to deploy 30 Wyse Technology Inc. Windows thin terminals at headquarters for SAP training, which he says cost 75% less than PCs. But the 600 PCs at headquarters still run the standard SAP client. "As CIO, it's not clear to me that I'll replace traditional desktops, given that you have to scale the back end so high," he says.

PAYOFF: After receiving preconfigured thin-client PCs and basic instructions, users were able to access the ERP system in Rome. "We got the Pakistan operation up and running in two hours," says Oftedal. The systems are easily reconfigured to use a backup VSAT connection, although latency created some connection problems. The World Food Program has since rolled out the system to 300 users in 29 other countries.

How the World Food Program Delivers the Goods

Workers in remote field offices connect to the agency's ERP system using a browser-based Citrix thin client that can run efficiently over the low-bandwidth connections provided by its dial-up ISP or satellite services. The system handles poor-quality dial-up connections well, officials say, but latency issues over satellite links have been a problem.



Thin Clients for Tough Times

Q&A Excerpts from a conversation with Steve Kaplan, a vice president and general manager at Houston-based Citrix reseller Vector ESP Inc. and co-author of the book *Citrix Metaframe for Windows Terminal Services. The Official Guide* (McGraw Hill, 2000).

Is it time to reconsider thin-client computing for its economic benefits? This is the way to deploy Windows 2000 without touching the PCs. One thing that people usually miss is they don't think about the remote offices and how they're going to be able to eliminate the infrastructure out there.

What's the most common mistake made when assessing the business benefits of thin-client computing? Putting in this infrastructure but then only using it for a couple of applications. If you're going to do it, do it for the whole desktop. Sure, you can make exceptions, but for the most part, go thin client everywhere.

What's holding back wider adoption of thin-client computing? I think it's people who rise up through IT decision-making because of an ability to manage perceived risk. And the most scary thing to a CIO is thousands of users screaming at them. It's fear. It's job security.

Is Thin Client Enterprise-Ready?

ANALYSIS RECENT IMPROVEMENTS in thin-client software were enough to convince Wells Fargo & Co. to buy a 10,000-user license for Citrix Systems Inc.'s MetaFrame XP. "We are geographically dispersed, and keeping servers and workstations up to date is becoming a very expensive proposition," says John Bolz, vice president and systems architect at Wells Fargo in San Francisco.

FACTORS TO CONSIDER

- Enhancements in Windows thin-client software scalability
- Better server load balancing
- Fault-tolerant designs that allow servers to span multiple data centers

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ONLINE EXCLUSIVE: Got Windows and Unix? See how users are deploying Tarantella thin clients, read an online Q&A about the future of X Window, and review our product feature comparison chart at: **www.computerworld.com/q?a1540**

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Extremely Agile Programming

These new programming methodologies are called **adaptive** because they react to changing user input, **agile** for their frequent iterations and continual testing, and **lightweight** because they emphasize small teams and downplay documentation. **By Alan Radding**

DAVID PLUNKERT

JENS COLDEWEY is an application development troubleshooter. When he comes onto a project, it's usually engulfed in trouble. By that point, management is often so desperate that it's willing to try almost anything. That's when Coldewey, a Munich, Germany-based independent consultant specializing in banking and financial services, turns to Crystal, one of the new agile development methodologies.

Agile is the label given to a growing number of methodologies with names like Scrum, Crystal, Adaptive, Feature-Driven Development and Dynamic Systems Development Method (DSDM). These new development approaches are based on the premise that if you hire competent developers, presumably they know how to write code. Any problems your developers encounter, therefore, aren't coding issues but organizational and communications ones, and those are what the agile approaches attempt to address.

Coldewey, for example, once jumped into a project that was on the verge of collapse. The team was developing a complex enterprisewide system at a bank and was under extreme pressure to show results fast. In keeping with the Crystal approach, Coldewey spirited away the development team to a remote site. "I told them that the way they work would be up to them. We would develop the process together," he recalls. This alone was a radical departure for the bank.

Then Coldewey handed out two sets of blank index cards, each set a different color. On one set he instructed the developers to write down the things they did in the past that speeded up development. On the other, they wrote things that slowed them down.

"In half an hour, we had a lot of cards of both colors," he says.

Continued on page 44

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Continued from page 42

After sorting through the cards, they quickly set up a process consisting only of things that sped development while avoiding the things that slowed people down. They followed the process they had just set up to knock out the first iteration of the system within a few weeks and met the deadline.

"We went through this exercise and made changes for every iteration until we had a stable process," which took about three iterations, Coldewey says.

Although the various agile approaches are different, they have some things in common. They're intended to produce software that can be changed quickly, and all specify short iterations and maximize the amount of time spent face to face. They also focus on team morale. "You can't talk about agile methodologies without talking about team morale," says Alistair Cockburn, the originator of Crystal.

The agile approaches differ from extreme programming (XP), although all of them are lightweight methodologies. Lightweight methodologies dispense with much of the software development process overhead that bogs down developers, such as lengthy requirements definitions and extensive documentation. XP, however, differs from the agile approaches by being much more prescriptive, even dogmatic, some might say [QuickStudy, Dec. 3]. XP revolves around 12 practices identified by Kent Beck, author of *Extreme Programming Explained: Embrace Change* (Addison Wesley Longman Inc., 1999).

Although XP in various forms has been around for several years, corporate IT is only just beginning to consider it. The chief obstacle is that some practices prescribed by XP contradict long-established IT policy. For example, XP specifies pair programming, in which two programmers sit side by side coding at a single workstation. Pair programming seems blatantly inefficient, but a series of studies has confirmed that the approach results in fewer code defects, which ultimately speeds final delivery.

"Pair programming is not as productive initially, but the design happens on the fly and the quality is outstanding. And since we have fewer defects, we're not spending time doing as much bug fixing. So the cost issue is moot," says one application development manager at a major U.S. bank.

XP also requires the customer for whom the software is being written to take an active, ongoing role in the development process — to the extent that the customer is asked to write a test to prove a requested function before it's actually coded. In XP, customers write desired functions on index cards (one function per card). The developers estimate how long it will take to code that function. Based on the estimates, the customer decides which functions to tackle first. Then the customer writes a test, and the developers write code to pass the test. This requires a serious commitment on the part of the customer, but in return, the customer gets exactly what he asked for.

XP's approach to requirements alone saves tremendous effort. "We're talking about a bunch of index cards vs. 100-plus-page requirements documents," says the bank manager. The bank turned to XP to develop a major enterprise document fulfillment system. When a bank client opens an account, the new system automatically generates all the appropriate documents and sends them to the client. In addition to the document fulfillment system, the bank has about 10 applications or reusable components built using XP techniques.

XP isn't perfect, however, and the bank has looked at other agile approaches. "XP doesn't address deployment," says the bank manager. So now he's looking at DSDM, "which has some life-cycle project management," he notes.

Lightweight Programming for Heavyweights

Lante Corp., a Chicago-based consulting company, recently held a conference on XP for its corporate clients in hopes of speeding its acceptance. To make XP more palatable to corporate managers, Lante has teamed with Beck to create what they're calling a one-team approach, explains David Trowbridge, Lante's director of technology. The one-team approach combines an XP development effort with an ROI team that analyzes the business and ranks project requirements on the basis of return on investment.

Lightweight methodologies have been adopted primarily by independent software vendors and Internet start-ups that don't have an entrenched development process. These approaches work best on projects where requirements change quickly and frequently or aren't fully apparent at the start.

Lante, which offers a range of development approaches, from traditional to agile, only recently found a major corporate client willing to try XP.

Similarly, Jim Highsmith, creator of Adaptive, an agile methodology, has started to work with a major pharmaceutical company. "They are kicking the tires. A few companies are using it on Internet projects, but it represents a big change for corporate IT," Highsmith notes.

A move to agile programming, in fact, strikes the most sensitive of nerves: honest communication. For years, corporate IT and users have worked separately. Lightweight methodologies bring everyone together face to face and keep them there.

"Now they have to be honest," says Beck, who set up the showcase corporate XP project at the automaker Chrysler several years ago. "No more padding requirements or inflating estimates." In exchange for hoosesty, organizations get functionality they need fast. To managers, it's a welcome trade-off. ◗

Radding is a freelance writer in Newton, Mass.

JUST THE FACTS

Agile or Nonagile?

Is your organization a good candidate for using one of the agile programming methodologies? **The answer may be yes, if you have:**

- Uncertain or volatile requirements
- Responsible and motivated developers
- A customer who understands and will get involved

On the other hand, more traditional, predictive approaches are indicated if your project involves:

- More than 50 developers
- A fixed-price or fixed-scope contract

SOURCE: MARTIN FOWLER "THE NEW METHODOLOGY" WWW.MARTINFOWLER.COM

Quick Link Thinking about using one of the agile methodologies? Check out some tips available on our Web site from Martin Fowler's "The New Methodology." www.computerworld.com/q/725403

Agile Programming Systems

For more on agile programming in general, see the Agile Manifesto at www.agilealliance.com and "The New Methodology" by Martin Fowler, at www.martinfowler.com/articles/newMethodology.html.

Extreme Programming

Built around 12 basic practices ranging from pair programming to frequent refactoring, this approach is more prescriptive than the others. For more information, visit *www.extremeprogramming.org* and *www.xprogramming.com* or read *Extreme Programming Explained: Embrace Change*, by Kent Beck (Addison Wesley Longman Inc., 1999).

Scrum

Based on the empirical process control model, Scrum programming relies on self-directed teams and dispenses with much advanced planning, task definition and management reporting. To learn more, visit *www.controlchaos.com* or read *Agile Software Development with Scrum*, by Ken Schwaber and Mike Beedle (Prentice Hall PTR, 2001).

Crystal

This approach empowers the team to define the development process and refine it in subsequent iterations until it's stable. To learn more, visit *http://crystalmethodologies.org/* or read *Agile Software Development: Software Through People*, by Alistair Cockburn (Addison Wesley Longman, 2001).

Adaptive

Based on adaptive rather than deterministic theories, this approach offers a series of frameworks to apply adaptive principles and encourage collaboration. For more information, visit *www.adaptivesd.com* or read *Adaptive Software Development: A Collaborative Approach to Managing Complex Systems*, by James A. Highsmith III (Dorset House Publishing, 2000).

Feature-Driven Development

This model-driven, short-iteration process is built around the feature, a unit of work that has meaning for the client and developer and is small enough to be completed quickly. To learn more, read *Java Modeling Color With UML: Enterprise Components and Process* (with CD-ROM), by Peter Coad, Eric Lefebvre and Jeff De Luca (Prentice Hall PTR, 1999).

Dynamic Systems Development Method

Conceived as a methodology for rapid application development, DSDM relies on a set of principles that include empowered teams, frequent deliverables, incremental development and integrated testing. For more information, visit *www.dsdm.org* or read *DSDM: The Method in Practice*, by Jennifer Stapleton (Addison Wesley Longman, 1997).

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PHP

BY SHARON MACHLIS

GREENLAND native Rasmus Lerdorf was tired of writing the same code over and over while creating his personal home page back in 1995.

So, he says, he wrote "a very simple parser" to replace tags in an HTML file with some code he'd written in C.

That project evolved into PHP, an open-source scripting language now installed at more than one in every five Web domains, according to an October 2001 survey of more than 6 million domains conducted by Netcraft, a Bath, England-based Internet consulting company.

PHP fans say the language is exceptionally easy to learn. It has a lot of built-in functions such as simple connections to databases and support for the Lightweight Directory Access Protocol (LDAP).

"PHP was developed from the ground up to be a Web platform," says Zeev Suraski, chief technical officer at Zend Technologies Ltd. in Israel and an author of the current version of PHP. "Very powerful applications can be created in a very short time. . . . This is the No. 1 feedback I get from people."

PHP code is highly portable; it moves from one brand of server to another with minimal or no rewrites. This multiplatform support appeals to IT managers who don't want to be locked into a single brand.

Free and Easy

As open-source software, PHP is free for corporate use and works well with other popular open-source projects, including the Apache Web server and the MySQL and PostgreSQL databases.

"If we didn't have PHP, it would cost us six to seven times as much to operate [our] IT environment," says Kevin Crothers, head of corporate Web systems at WorldCom Inc. WorldCom has used PHP for several major Web projects, both internal and external, including the front end to a searchable database of employees and contractors that contains more than 100,000 records. "It's all LDAP-based," he says, noting that PHP had "the strongest LDAP integration we've been able to find."

PHP uses server resources efficiently, Crothers says. It uses memory sparingly and allows client-side interpretation of code to shoulder some processing burden.

"There's money in your pocket right there," he says, because a PHP-based application requires less server hardware than some other environments. Crothers adds that he has found PHP to be both stable and secure, and he believes that the language is very easy to learn compared with competing technologies such as Microsoft Corp.'s Active Server Pages (ASP) technology for dynamic Web applications.

Room for Improvement

However, many developers generate ASP code from software such as Microsoft's Visual InterDev, which can be easier for nonprogrammers than coding in PHP, Suraski notes.

At present, there are no high-level commercial WYSIWYG Web authoring tools that automatically generate PHP pages, which means you need actual programming knowledge. That doesn't appeal to every Web development shop, but Suraski says he believes some PHP authoring tools will be out later this year.

He also acknowledges that PHP's object-oriented programming capability, compared with that of Java, for example, "is not as powerful as it should be." This can make PHP a bit more cumbersome for creating very large-scale applications. However, improvements are in the works for PHP Version 5.0, he said, which is due sometime in the second quarter.

Lerdorf says other upcoming improvements include making PHP Extension and Application Repository (PEAR) more useful. PEAR solves some Web-related problems but isn't part of PHP itself. "You will also see some nice ways to build [Simple Object Access Protocol/Web Services Description Language] services with PHP," he says.

PHP is an interpreted language and doesn't use compiled binary executables, so PHP applications can be more easily viewed and dissected by competitors, says Crothers. For hiding code or creating applications for resale, products such as Zend's Encoder will mask some work.

For professional-level quality assurance and testing, Crothers advocates using a product such as Komodo from Vancouver, British Columbia-based ActiveState Corp. Komodo's integrated development environment is available free to individuals and nonprofit organizations.

Ultimately, Crothers says, PHP is an excellent environment for creating Web applications for WorldCom. "It does everything," he says.

DEFINITION

PHP is an open-source, server-side scripting language designed for creating dynamic Web applications. Originally an acronym for Personal Home Page, PHP now stands for PHP: Hypertext Preprocessor — a change made after the scripting language evolved far beyond its home-page-creating origins.

```
<? mail($tomail, "User Comments", $comments, "From: $frommail\n\n"); ?>
```

Above is an example of simple PHP code for e-mailing data entered into an HTML form, where the form has fields called *comments* (for comments entered by a user) and *frommail* (for a user-entered e-mail address), as well as a hidden field *tomail* (for the address where information should be sent). The e-mail would be sent with the subject line "User Comments."

In a production environment, additional code would be added for validation and security.

PHP or Perl?

Perl has been a popular language for developing Web applications. But is it better than PHP for creating dynamic Web applications? Opinion is split among programmers.

Many who like to get under the hood and have a great deal of control favor Perl. And as a general-purpose language, Perl has more capabilities and a more robust debugging environment than PHP.

In Perl, many Web tasks require add-on modules, whereas PHP uses built-in functions. Some see this as a disadvantage, while others say it lets programmers pick the best implementation for a given task.

Perl's power and flexibility can make it more difficult to learn and use. "You can't do as much with PHP, but those restrictions allow novices to pick up PHP more quickly than Perl, because there are fewer ways to go wrong," says Jon Orwant, editor of *The Perl Journal*.

Many programmers use both. "I personally use a combination of PHP and Perl for many of my projects: Perl mostly for back-end tasks, while I have PHP doing all the front-end work," says PHP inventor Rasmus Lerlorf. "You could do the front end in Perl, but it would be a bit more work."

– *Sharon Machlis*

Quick Link To read an interview with Lerdorf, visit www.computerworld.com/s/124705
For PHP resources on the Web, see www.computerworld.com/s/tn1530

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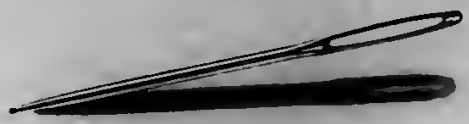

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Getting Security Priorities Straight in the New Year

Router security holes, virus vulnerabilities and smart cards hit the front burner as 2002 begins

BY VINCE TUESDAY

OUR OFFICE IS usually quiet this time of year. Our financial year-end isn't sorted out until the end of January, but once that rush is out of the way, we enjoy a peaceful few weeks planning for the next year.

I know that regardless of the plans I make, I'll have to react to changes in my company and to wider events in information security. But without an idea of what I hope to achieve, I know I'll spend my year bouncing from emergency to emergency.

I can't avoid emergencies, but there are some improvements I can make to our policies and methods to reduce our risk of being hit by severe crises.

SECURITY MANAGER'S JOURNAL

I expect routers to become a large area of concern this year. The CERT Coordinatioo Center in Pittsburgh, which isn't the fastest off the block with warnings these days, has released notifications about routers being used for attacks.

We already use the access control lists (ACL) within our routers to apply logical access control, a sort of cheap and cheerful firewall setup for internal segregation. We have several hundred routers of various sorts and many network staffers who can access them. This complicates the management of ACLs, particularly configuration changes.

We'll be looking at Mountain View, Calif.-based Solsoft Inc.'s Solsoft NP product to help in the management of all of our ACLs. Although we have integrity-checking on our Windows and Sun Solaris systems, we will consider installing Portland, Ore.-based Tripwire Inc.'s Tripwire for Routers and Switches to identify unauthorized changes to the configuration of those systems.

Another project that will keep us busy between incidents is a major upgrade of our intrusion-detectioo systems (IDS). The network IDS will be the easy part. Our vendor, Atlanta-based Internet Security Systems Inc., has added a whole new architecture to its latest version. We will build and deploy new central servers and undergo new training — and a whole new learning curve.

Every plan or budget should have a "blue sky" project that will almost certainly get discarded in the prioritization process, but I include mine to show that we are thinking ahead and have an eye toward the future. (I also hope that cutting my blue-sky project will save me from having to cut more necessary projects.)

Bypassing Biometrics

Some people claim that 2002 will be the year of biometrics. However, they said that about 2001 and just about every year since they stopped promoting the year of public-key infrastructure. We won't be doing anything with biometrics. I've heard too many horror stories.

My current favorite, from another company, is a rollout to a trading floor on which a pair of identical twins worked. Apparently, the system was unable to identify any difference in their fingerprints. I came up with a few ideas to help them: Brand the company logo on one twin's thumb, or scar their thumbs with acid. But these were rejected, and an exemptioo to the biometrics policy was made for those two people.

Rather than biometrics, my mad idea is to launch new cards for all staff members. The cards will combine swipe-card access to the offices, cashless vending for the canteen and snack machines, and log-in capability for desktops. If a staffer removes his card from a desktop, the machine will be locked so it can't be used while he gets food or visits tbe washroom.

We can eliminate the costs of password resets and the risk of weak password security. We have yet to crack how to make this work for remote access, but I'm sure we can find a suitable solution.

We've sounded out the physical security teams, and they support the idea, but it'll be expensive and hard to get the cards working across all our systems. I expect that the project will be canned at the blueprint stage. Eventually, however, tbe time will be right, and laying the groundwork will have been worthwhile.

Year of the Worm

2001 was the year of the worm with some highly virulent examples. We avoided infection because we had protective measures in place and because we were lucky.

We can't count on being lucky forever, so we'll have to be more careful. And the threat keeps growing. The recent bug in the Unix log-in command will oo doubt sooo be rolled into an automated attack. Since Linux and Unix haven't historically suffered from virus infections, few machines are protected with antivirus updates, leaving them open to become reservoirs of infection that can launch probes onto other machines. I'll have to look into deploying antivirus protection onto our Solaris servers this year.

I've also got a nagging concern about Secure Sockets Layer (SSL) access to Web sites. We encourage SSL use because it protects staff information from being intercepted or tampered with in transit on the Internet. However, using SSL means that as data is encrypted, our proxy servers can't scan the downloads for viruses, leaving us reliant on desktop protection. It's very hard to ensure that all desktops are updated in a timely fashion. Before we had effective gateway protection from the worms, we had outbreaks despite desktop cover.

One new virus takes the biological metaphor even forther by using evolution to update its attack methods. Once the virus infects a certain number of machines, it posts the method it used as a chunk of code to a newsgroup. Other copies of the virus read the newsgroup automatically and start using the methods that are most commonly posted to improve the program's ability to spread.

Not only can the virus writers update their code once it's out there, but just as in the biological world, those viruses that survive attempts to destroy them will pass on their methods to other copies. I expect we'll see a lot more of this in the next 12 months.

I expect that 2002 will include more — and more severe — informatioo security incidents across all companies. Although I hope we won't be as badly hit as those who haven't taken reasonable precautions, I still don't feel secure. What have I missed? What are your plans and predictions for the rest of the year? Let me know in the Security Manager's Journal Forum. ●

LINKS:

www.cert.org/archive/pdf/DoS_trends.pdf: Every security manager should read this CERT report, published in October, about the risks of routers and denial-of-service attacks.

www3.ca.com/solutions/collateral.asp?CT=65&ID=1197: Here's the skinny from Islandia, N.Y.-based Computer Associates International Inc. on the evolutionary Win32.-Hybris virus, which uses newsgroups to spread.

http://xforce.iss.net/alerts/advise105.php: Read this alert from Atlanta-based Internet Security Systems Inc. to learn about a serious buffer-overflow vulnerability in the log-in program used by Solaris and other operating systems based on Unix Sys V.

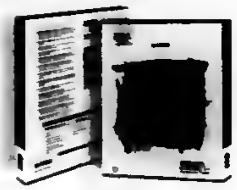
www.solsoft.com/: This site includes information on the Solsoft NP security policy manager I'm evaluating.

www.tripwire.com/: I'm considering using Tripwire for Routers and Switches to monitor our routers, but Tripwire also offers a version that works for servers, as well as an open-source Linux edition.

Quick Link Discuss this week's column and catch up on the latest security developments online at: ***www.computerworld.com/q?q2000***

● This week's journal is written by a real security manager, "Vince Tuesday," whose name and employer have been disguised for obvious reasons. Contact him at vince.tuesday@hushmail.com or go to the Security Manager's Journal forum.

You won't see the next network security threat coming.



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Search Tool Delivers Relevant Answers

Accuracy and ease of use distinguish Atomica's Answer Delivery search engine

BY MARK HALL

A LITTLE-remarked-upon consequence of the Food and Drug Administration's acceleration of the process for approving drugs has been that medical dictionaries quickly become outdated. This has forced many scientific and medical researchers to rely on the Web for the latest information.

But the problem with the Web, according to Bruce Maliken, internal support supervisor at Silver Spring, Md.-based Social & Scientific Systems Inc., is that most search engines give users too much unnecessary information to sort through.

That's why his and other organizations have embraced search technology from Atomica Corp., a 60-person start-up in Burlingame, Calif.

Maliken describes Atomica's Answer Delivery software as "an assisted search engine" that lets users at his 285-person consultancy search the Web as well as in-house documents and resources.

Selling Simplicity

The key to the software's success, say Maliken and others, is that it's simple to use.

Founded in 1999 as GuruNet, with a product by the same name that focused only on Web content, the company revised its Web-only approach in late 2000, adding enterprise-specific tools and renaming itself. What the company didn't change was its emphasis on ease of use.

"Most people who need information are not power users of enterprise software like Siebel or SAP," explains Bob Rosenschein, Atomica's chairman, founder and CEO.

The company currently ships Atomica Enterprise and Atomica for Lotus Discovery Server. But it has gone a step further by offering subject-area search tools, which provide for more targeted and predefined information sources.

The first product, Atomica Enterprise for Sales and Marketing, has templates to help users gather information in areas such as product development and competitive analysis.

The U.S. Geological Survey (USGS) has been working with Atomica Enterprise, preparing to roll it out to its offices in all 50 states.

According to Denise Wiltshire, senior adviser for strategic planning at the agency's headquarters in Reston, Va., the prototype work done so far has been promising.

The USGS has a lot of data in its offices that needs to be readily available to its internal users as well as to its customers in education, government and other industries, she says.

Wiltshire explains that building a unified portal "to synthesize and integrate everything is a costly thing to do." Yet once such automation is done, the cost benefits are there to be reaped, she says.

Automation Benefits

Wiltshire says she's considering using Atomica's tools so the USGS can get the benefits of automation without investing in a full-scale portal. With Atomica, she says, her users have found they have "the capability to reach down into scientific data, text, bibliographic data and synthesize it and customize it for our audiences."

Atomica's software is already paying off for Social & Scientific Systems. "It's made my users more productive," Maliken says. Worker productivity is a priority for the company — so much so that IT has someone working nearly full-time just to eliminate spam, which wastes employee time, he explains. The Atomica technology has helped improve performance, he says.

That's because it's fast and easy to use. The search bar floats on the screen no matter what application a user is in, and it grabs information from the Internet without loading advertisements that can distract users and slow response time.

Atomica's software also works with standard Lightweight Directory Access Protocol directory services so users can access only internal data sources for which they have set permissions.

Both Maliken and Wiltshire offer their kudos to Atomica's staffers. "They're extremely responsive to needs and ideas," says Maliken.

Wiltshire says the start-up's small size works to its advantage. "They're nimble and jazzed," she says.

Most people who need information are not power users of enterprise software like Siebel or SAP.

BOB ROSENSCHEIN, FOUNDER, CHAIRMAN AND CEO, ATOMICA CORP.

Atomica Corp.

1409 Chapin Ave.
Burlingame, Calif. 94010
(650) 425-1000

Web: *www.atomica.com*

Niche: Information retrieval systems for enterprise and Web-based resources and repositories

Company officers:
- Bob Rosenschain, founder, chairman and CEO
- Mike Spangl, president and chief operating officer
- Mark Matossian, vice president of finance and administration
- Jeff Schneiderman, vice president of engineering

Milestones:
- January 1999: Company founded as GuruNet
- November 2000: Name changed to Atomica.
- March 2001: Atomica Pro ships.
- August 2001: Atomica Answer Delivery System for Enterprise ships.
- October 2001: Atomica Answer Delivery System for Lotus Discovery ships.

Burn money: $32 million from venture capitalists and private investors, including Flatiron Partners, Garage Technology Ventures and John Scully

Products/pricing: Enterprise implementation is $100,000, plus $250 per user per year.

Customers: USGS; Social & Scientific Systems; Foxboro School District, Foxboro, Mass.

Red flags for IT:
- Atomica's systems aren't as powerful as a search portal.
- The systems lack some administrative tools.
- Atomica's systems don't allow for compound-word search capabilities.

COMPUTERWORLD emerging companies

[the buzz] STATE OF THE MARKET

What's in a Name?

Cute names are the norm in the search technology market. GuruNet morphed into Atomica, and PurpleYogi, the company's Mountain View, Calif.-based competitor, relaunched itself as Stratify Inc. a few years ago.

Fortunately, the software from these companies is better than cute, according to Kyle Johnson, an analyst at Cambridge, Mass.-based consultancy Forrester Research Inc.

Good technology, however, won't necessarily get noticed in a market with overlapping competitors. Johnson points out that Atomica not only directly competes with Stratify, but the company also has to deal with portal players such as Plumtree Software Inc. and E.piphany Inc. as well as search engine providers such as Autonomy Corp. in Cambridge, England, and Inktomi Corp. in Foster City, Calif.

"Still," he says, "they're an interesting alternative to portals."

Atomica is more interesting when it comes to price. Johnson estimates that an enterprise installation of Atomica's software runs about $100,000, while San Mateo, Calif.-based E.piphany's portal generally costs $150,000 and San Francisco-based Plumtree's software averages $230,000.

Shortfalls

Johnson says that despite the complexity and cost differences, portals do far more for companies than Atomica can. For example, he says, Atomica's software has fewer administrative tools and fewer development opportunities to integrate it with other applications.

Even bullish users want more from Atomica. Social & Scientific Software's Bruce Maliken, who raves about the product, says it does a poor job handling compound-word searches and it's too focused on business. The product needs to build in more scientific domain expertise, he says.

Atomica CEO Bob Rosenschein says the search software will acquire more features in time. He argues that ease of use and the ability to search both Internet-based and company-housed information sources are the most important features to get right first.

– *Mark Hall*

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- **Patrick Gelsinger**
  VP & CTO, Intel
- **Norman Lorentz**
  CTO, U.S. Federal Government
- **Irving Wladawsky-Berger**
  VP of Technology Strategy, IBM

FEATURED SPEAKERS

- **Kent Beck**
  Director, Three Rivers Institute
- **Marc Benioff**
  Chairman & Founder, salesforce.com
- **John Blair**
  Co-founder, President, & CEO, Kenamea
- **Tim Bray**
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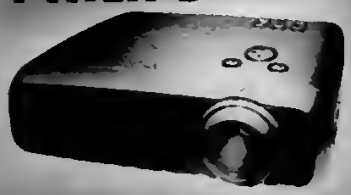

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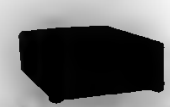

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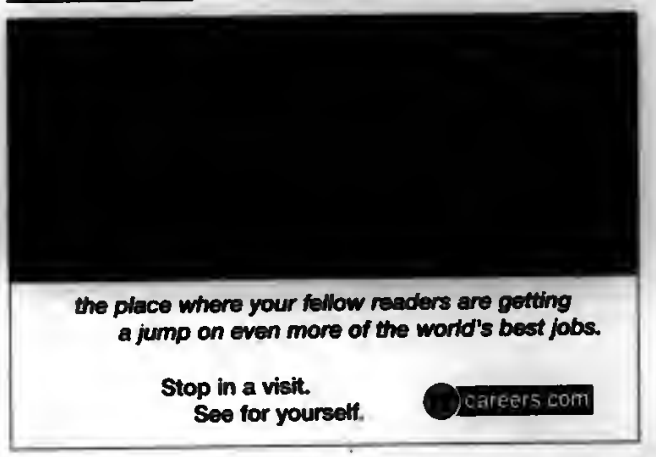
Database/Systems Administrator: Manage & administer Windows 2000 Server & SQL Server 2000 database & applications. Help establish & manage database & system change mgmt. procedures. Assist w/architect overall data structure. Provide performance tuning & data conversion service. Manage scalability & system upgrade process. 3 yrs exp. in the position offered in a database or systems administration position managing mission critical database environment w/large user base. 3 yrs exp. must include exp. in Microsoft IIS Server, Microsoft Digital Internet Architecture, Microsoft Clustering Technology, Microsoft Biztalk Server, Microsoft Message Queue. MCDBA required. Resume to: Ash Momin Supna Technologies Corp., 4436 Lyngate Dr., Lilburn, GA 30047



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Full-time Project Manager of Accounts Document & manage project plans, scope, objectives & timeline of various projects for assigned accounts. Supervise & direct project team members. Responsible for direct communications w/ clients, monitor analysis & evaluations regarding clients business & technical requirements to insure quality of the implementation & customer satisfaction. Work w/ Visual Basic, C, C++, SQL Server MS Access, Oracle, Sybase & Cold Fusion. Must have a Bachelor's degree in CS, Computer Engineering or related field. Must have 2 yrs. exp. in job offered or position w/ same duties. Salary: $60,000. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126

IT SUPPORT ENGINEER Designs, develops and maintains software for LINX data collection terminals. Assembles and maintains PC hardware including POS and TPOS systems (pole displays, receipt printers, scanners and network). Installs and supports ICVERIFY multi-user credit authorization service. Designs, develops and maintains hardware, software for RF data collection systems. Designs, develops and maintains applications used in retail stores and back-office systems utilizing Visual Basic 6.0, Crystal Reports 8.0 and relational databases. Provides bilingual (Spanish-English) "Help Desk" support for stores and support center users, including off-hours on-call support. Job is in Boca Raton, FL. 40 hrs. weekly, 9-5PM, $66,000.00/yr. Bachelor's degree in equivalent in Systems Engineering or related field and 2 years experience in job offered. Fax resume to 99s Stuff, LLC, Attention Russ Field (561) 999-0518

SOFTWARE ENGINEER

The Software Engineer shall perform systems architecture, systems analysis and design; Internet technologies, programming, programming languages database design, data modeling, database programming. Java and C++. Must have a minimum of a Masters Degree in Engineering Science, Computers or related experience; will accept Bachelor's Degree plus five years experience as described above.

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Sr Software Eng'rs Degn, dVlop & implement web-based on applica'n w/ASP, SQLServer 2000, 7.0&6.5, ADO, JavaScript, VBScript, DHTML, HTML. Dsgn DB & frontend for applic'n w/ SQL, Oracle8.x, & convert DB from DB2/Oracle into SQLServer based. 40h/w, 8-5, BS in computer-related field/foreign equivalent & 5 yr wk exp. in job offered or in any other position involv'g ASP, DB2/Oracle, & SQLServer. Resume to L. Ward, Best Software, Inc. 898 Exec. Ctr Dr W #300, St. Pete, FL33702, or at laurie.ward@bestsoftware.com fax. 727 578-2179

Full-Time IMC Senior Database Consultant. Responsible for interacting with client managers, integrators and users regarding functional aspects of assigned projects. Identify client's business requirements, determine enhancements, create functional design specifications, and provide change management guidance working with BSCS, Gupta/Centura, Oracle, Unix, C, PL/SQL, Visual C++, Visual Basic, Visual Fox Pro, MS SQL, Access and TCP/IP. Assist clients with conversion strategies and plans and resolve/troubleshoot all conversion issues. Develop testing strategies, plans and analyze codes to determine database population and defects. Must have Bachelor's degree in Computer Science, any Engineering discipline or related field. Foreign degree equivalent accepted. Must have 4 yrs. exp. in job offered or position or same duties. Salary: $66,000. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126

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Applicants will have a Bachelor of Science degree in Telecommunications, Engineering or a closely related field and experience with engineering and integrating connectivity to Equities Trading Exchanges (eg NYSE, NASDAQ) & ECN's (eg Island, Archipelago).

Certifications Required:

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Consulting comp. in NJ req for its ongoing conversion Projects a System Analyst w/BS Deg. or its equivt. & 2 yrs. exp. of design exp. in Financial/Accounting packages. Candidate should have req. skills on the AS/400/OS/400/SYNON 4E/JD Edwards & Oracle Platform. Emolmts. is based on edu & exp. Travel & relocation req. to unanticipated client sites. Send resumes to Attn: RECRUITER, TRANSWORLD INFO. SYSTEMS, Inc., 33 WOOD AVE., 7 FL. ISELIN, NJ 08830

Software Engineer (Melrose Park, PA) Analyze design, develop, implement programs for commercial & financial applications. Uses VB 6.0/5.0, Oracle 3i/8.0, SQL+, PL/SQL, web technologies COM, DCOM, MTS, ActiveX, VB Script, DHTML, BS Comp. Sci./Eng. Fax resume 215-782-2083 Ref: RM

Systems Analyst needed for Miami computer sales and export co. to review computer system capabilities, workflow, and scheduling limitations. Min req. 4 yrs exp. Send resumes to TWC The Wise Computer, Inc. P.O. Box 228438 Miami, FL 33122

InfiniSwitch is a leader of InfiniBand switching technology for data centers. We are currently seeking Software Quality Assurance Engineers. Our Software Quality Assurance Engineers will work with the InfiniBand specifications and with input from other engineering team members to isolate and expose system and sub-system problems and develop resolutions. They will also develop and execute test plans and cases required to fully test and qualify InfiniBand Switch products, and conduct software integration testing, load/performance testing and install Operating Systems and Networks. Requirements include a MS in CS or closely related and two years experience as Software Quality Assurance Engineer (or will accept BS in CS and five years experience, two of which are in QA). Also required is high degree of proficiency working with following: Linux or Windows 2000 operating systems; Network switches, fibre-channel SAN components, or SNMP Management testing; and application load/artificial traffic load generation, test automation, or performance testing. Interested applicants may send their resume to Human Resources, InfiniSwitch Corporation, 134 Flanders Road, Westborough, MA 01581, F 508-870-3146

Several computer related positions available for a large communications, marketing and distributing company. Degree, technical skills & experience vary per position. Send resume to Ernie Mueller, CMD Services, Inc., 3060 Premiere Parkway, Duluth, GA 30097

PRODUCT MANAGER (INTERNET), U.K. & EUROPE ISSUES -(New York, NY), define Product Vision & Direction For All Company Products (Internal & Connectivity Solutions) in UK and Europe. Act as primary point of contact for UK sales and marketing teams. Oversee market analysis and oversee all product development initiatives for region, act as an interface between US product management and UK/Europe. Bachelors Degree in Business Administration/Economics, 1 year experience. 40 hours per week, 9:00 AM to 5:00 PM. Send resumes/letter to: HR Dept., Globix Corporation, 139 Centre Street, New York, NY 10013

Exp'ed Prog/Sys Analysts, Network Engineers, DBAs and S/W Engineers required for branch locations in Santa Clara, CA, Mt. Laurel, NJ, Conshohocken, PA. Skill sets - C, C++, Java, HTML on UNIX/Windows; Visual Basic, Visual C++, PowerBuilder Oracle, PL/SQL, Pro*C; UNIX, Windows 2000/NT Sys. Admin. Require BS/MS in CS/Engg/Math/Business/Science (or its foreign equiv and/or equiv. in education and exp.) And relevant exp. Travel/Relocation required. Salary commensurate with exp. Resumes to HR, Fourth Technologies, 27 Roland Avenue, STE 8, Mount Laurel, NJ 08054. Indicate on resume the branch office you are applying for

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Software Engineer (Melrose Park, PA) Programming in .NET, VB/ASP+, MTS, Tuxedo, CDO, T-SQL, Mantiare SQL Exchange, IIS Servers. Designs & Develops applications like HRMS, Airline Ticketing, EBiz Medical Software. Prepares Technical Project Proposals. Fax resume 215-782-2083 Ref: DD.

Senior Database Administrators Newton, MA office needs experienced individuals for performance monitoring, tuning and testing. Send resumes to: C. Wyrga, EIS-CW02-SOBA, Eagle Investment Systems, 65 LaSalle Rd., W. Hartford, CT 06107. EOE/F/M/V/D/Legal workers only please.

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Computer Professional needed w/exp in: Oracle Tools, Oracle enterprise Manager Network Manager Developer Suite, Export/Import, Oracle Application Server, Microsoft IIS, RMAN, SQL*Plus, ERWIN, SQL*Net, PL/SQL, SQL*Navigator, SQL*Loader, C, C++, Java, Javascript, PB, COBOL, CICS, DB2, VSAM, UNIX Administration, Sun-Solaris Administration, MS Windows/NT. Apply to: Prosoft Consultancy Services, Inc., 15310 Amberly Dr Suite 250-12, Tampa, FL 33647. No in person resumes/interviews, only respond by mail or e-mail

Network Administrator needed for Miami Beach computer and electronic sales co. to monitor data communications network to ensure that the network is available to all system users. Min req 2 yrs exp. Fax resumes to Sound Connection and Distributors, Inc. (305) 538-0661

Computer Graphics Designer in NYC. Masters in Communication Arts or related with concentration in Computer Graphics or related. Min. 1 yr exp: designing 3D animated moving graphics for web pages, maintenance of web graphics; Access, PhotoShop 5.0, HTML, DHTML, JavaScript, HTML/Graphic editors; 3D design, 40 hrs/wk M-Fri 9-5. Send resume to: Job 8, P.O. Box 5275, New York, NY 10185-5275.

Computer Systems Engineer needed for Miami Architecture co. to analyze data requirement and plan data processing system for projected workloads. Min req. 4 yrs exp. Send resumes to Architectural Design Consortium, Inc. P.O. Box 370546 Miami, Florida 33137.

Jr Programmer. Assist in design & dev of s/w sys. inc. functional & tech. specs. Conduct needs analysis. Assist in developing sys. procedures, docs, coding, & testing progs. Req. BS in Computer Eng or Computer Sci. 40-hr wk. Job/Interview Site: Diamond Bar, CA. Send resume to MTSI Inc. PO Box #207, 1142 S. Diamond Bar Blvd., Diamond Bar, CA 91765.

Software Engineers
Automated Power Exchange located in Santa Clara is seeking Software Engineers possessing MS/BS or eqiv and/or relevant work exp. Work exp with RDBMS + SQL, MS SQL Server and one or more of the following: Javascript, VBScript, ASP, VB and XML. Exp. developing commercial applications and dealing with settlements in the power industry desired. Must be willing to travel and relocate as required in the U.S. Mail resumes to: Automated Power Exchange, c/o HR, 5201 Great America Parkway, Suite 522, Santa Clara, CA 95054.

Junior Programmer. Assist programmers in developing finance and accounting software with the use of database and spreadsheet programming. Requires a B.S. Computer Science/Computer Eng or related field. 40 hour work week. Send resumes to eMachines, Inc. 14350 Myford Road, Bldg. 100, Irvine, CA 92606.

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Candidates must have a Bachelor of Science degree in Computer Science or Business Administration with coursework in computer information systems. Candidates must also have permanent authority to work in the United States.
Send resumes to Human Resources, Davenport University, 415 East Fulton, Grand Rapids, MI 49503.

Software Development Engineer – Collins & Aikman is seeking individuals with specialized skills in Graphical User Interface (GUI) software development for the position of Software Development Engineer. A Master's degree in engineering, computer science or related field is required for this position, as well as one year of experience developing GUI software features using X-Motif and Java programming languages. Fax or mail resumes to Attn: Director Global Acoustic CAE Technology, Collins & Aikman Corporation, 47785 West Anchor Court, Plymouth, MI 48170-2455. Tel. 734-207-7302, Fax: 734-354-2220, Email: astha.raveendra@colalk.com

Sr Systems Engineer Design, prototype debug, & test embedded hardware, radio sys., & software; perform simulation, schematic entry & PCB layouts. M.S. in Elec. Eng., Comp Eng., or rel field & 5 yrs, rel exp or equiv. educ. & exp. 5 yrs. exp to include A/D & D/A conversion; DSP sys. hardware Assembly; C/C++, in-circuit emulators & logic analyzers; PCB layout tools. Send appls. to Marv Van Wye, Vermeer Mfg. Co., 1210 Vermeer Rd East, Pella, Iowa 50219.

Manager of Information Services & Operations. Manage network and computer infrastructure, web site and user support; create and implement operational procedures. Prepare contingency plan for e-mail server, financial applications server, RDBMS server, and Internet. Evaluate and implement Internet and LAN security. Manage network cabling infrastructure based on AT&T standards, monitor LAN and WAN performance. Manage and troubleshoot high-speed modems and switches for leased line, T1 lines, etc. Install, troubleshoot, and monitor software and hardware based routers connecting overseas. Design network connection between European, U.S. and Asian offices. Install, manage, and troubleshoot remote connectivity for European, South American, and Asian Offices. Plan for new Sun-based servers to run RDBMS system; Install connectivity from local to remote client. Must have Bachelor's degree in Computer Science or related, plus four years experience. Must be able to design networks over T1 and leased lines, provide network management, security, and troubleshooting; use IP routing technologies, gigabit ethernet, remote access with VPN connectivity, Check-Point Firewall-1, Cisco Catalyst Switches, VLAN, and Sun Solaris. Must have knowledge of Asian and European telecommunications standards. Send resume with cover letter to Genetic ID, Attn: Jana Pappin, 901 Dimick Drive, Fairfield, Iowa 52557

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Send Resume to: Gloria at 6006 Bellaire Blvd. Suite 6117, Houston, Texas 77081 or send via e-mail: jobs@tecmag.com

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We require a Master's degree in Computer Science or Information Systems required; 1 year experience in the position or 1 year as Data Analyst and/or Programmer Analyst required. Related occupation must include experience in analyzing, designing, coding & implementing software systems, programs and applications using Microsoft Access, Visual Basic and SQL Server. Excellent oral/written communication skills.

We offer a competitive salary and comprehensive benefit package including a 401(k) plan. Qualified candidates should send resumes with cover letters, including salary requirements to: Human Resources Department, Federal Home Loan Bank of Chicago, 111 East Wacker Drive, Suite 800, Chicago, IL 60601 e-mail hr@fhlbc.com or fax to (312) 565-5812. EOE M/F/D/V.

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Programmer Analysts: Design and develop client-server applications using Oracle Financials. Customize payable order, conversions, interfaces, manage new products or enhance existing products using, VB, SQL Server, PERL, ASP and XML. Analyze business procedures, solve problems, redefine and convert data to a programmable form. Requires a Bachelor's in Computer Science or Engineering or a related field and 2 years of experience.

Send Resume to HR, ECAL Solutions Inc., 9207 Country creek Drive, Suite # 207, Houston, Texas 77036 or via e-mail at: hr@ecalsolutions.com

Systems Engineer

Test, install and maintain computer operating systems, monitor and install data communication lines; maintain the NT infrastructure; develop, implement computer networking plan, test and implement Chinese interface of the chips of elevators. Master degree in computer science is required. Send resume to Mr. Marvin W. Schumacher, Schumacher Elevator Company, Inc., One Schumacher Way, Denver IA 50622

eCommerce Software Engineer II - Milwaukee, Wisconsin. Researches, designs, and develops eCommerce applications. Designs applications to meet requirements specified by the Web To Team Lead Designs Class and Sequence Diagrams. Facilitates Design Reviews. Facilitates Code Review for her/his own work. Participates in Use Case development. Performs detailed technical assessment of new technologies and platforms, and recommends direction to Software Engineer Team Lead and Web To Team Lead. Performs integration of Web applications to various Business Systems and the integration of the same Business Systems to various 'Workbench' processes. Develops code for individual components of Web, Workbench, and integration applications. Designs user interface to ensure easy-to-follow user screens. Builds and executes test plans. Participates in content generation and updates to theeCommerce solutions. Tracks and logs time spent on all activities and submits weekly Status Reports to Software Engineering Team Lead. Other duties may be assigned. Required is a Bachelor of Science degree in Computer or Software Engineering and a minimum of one (1) year post-baccalaureate work experience as a Software Engineer. As part of the required previous experience, the applicant must have had experience in the formal design, development, implementation and test of software systems based upon system requirements and experience with the following software platforms: C/C++, Visual Basic; JAVA ver 1.1 Websphere Application Server, XML and ASP modeling, and MS Visual Modeler. Must have proof of legal authority to work permanently in the United States. For consideration, please apply online at www.bradyserp.com An Equal Opportunity Employer

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Programmer Analyst (multiple openings) Plans, develops, tests, and documents computer programs. Converts project specifications, using flowcharts and diagrams into sequence of detailed instructions and logical steps for coding into computer language. Analyzes, reviews and alters program to increase operating efficiency or adapt to new requirements using relational database management system (RDBMS) and related software. One year of experience in job offered or as a computer professional required including one year of experience using 1 of A as follows: Informix, Oracle, FoxPro, Sybase, SQL Server, Progress. Work involves extensive travel and frequent relocation. Bachelor's degree or foreign equivalent or equivalent combination of education and experience in one of several limited fields: Computer Sci/Apps, Eng, Chem, Math, Physics or scientific or business related field. Salary: $67,000 per/yr. 40 hrs/wk., 8:00-5:00 p.m. Please submit resumes to Director, Pittsburgh/Allegheny Co. CareerLink, ATTN: JS Supervisor, 425 Sixth Ave, Suite 2200, Pittsburgh, PA 15219. Reference Job Order No. WEB 222444.

Programmer Analyst consulting positions (multiple openings) to plan, develop, test, and document computer programs, applying knowledge of programming techniques and computer systems. Converts project specifications, using flowcharts and diagrams, into sequence of detailed instructions and logical steps for coding into language processable by computer, applying knowledge of computer to run and test programs. Analyzes, reviews, and alters program to increase operating efficiency or adapt to new requirements. Must travel and relocate frequently. 3-4 year Bachelor's degree or foreign equivalent required. Candidates must have one year of experience in the job offered or as a computer professional. Candidates must have one year of experience using one of the following: Informix, Oracle, FoxPro, Sybase, SQL Server, Progress. $67,000 per/yr, 40 hrs/wk. Please submit resumes to: Fayette County Team PA CareerLink, ATTN: JS Supervisor, 22 Iowa Street, Uniontown, PA 15401-3513. Job Order # WEB 222432

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Software Engineer consulting positions (multiple openings) to design, develop and implement computer software systems applying principles and techniques of computer science, engineering and mathematical analysis. Analyze software requirements to determine feasibility of design and directs software system testing procedures, programming and documentation. Must travel and relocate frequently. Bachelor's degree or functional or foreign equivalent is required in one of several limited fields: Computer Science/Applications, Engineering, Chemistry, Math, Physics, or business related field. Candidates must have six months of experience in the job offered or as a computer professional. Candidates must have six months of experience using one of the following: Informix, Oracle, FoxPro, Sybase, SQL Server, Progress. $67,000 per/yr. 40 hrs/wk. Please submit resumes to Manager, Washington County Team PA CareerLink, Mitcraft Center, Suite 150LL, 90 West Chestnut Street, Washington, PA 15301-4517. Job Order # WEB222425

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PROGRAMMER: Design flowcharts, convert data & write program, enhance hotel database using Word Star Pro., dBaseIV, Pascal, C, HTML for Web Programming, & Spreadsheet using Lotus 1-2-3. Req: 2 yrs. exp. in job off. or 3 yrs. as Tech. Support Mgr. Resume to: Hospitality ventures Lavista, 2180 Northlake Pkwy, Tucker, Georgia 30084

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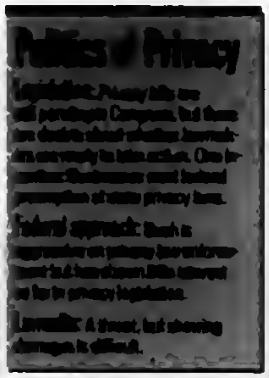

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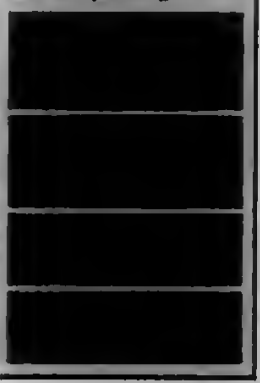

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Politics of Privacy

Legislation: Privacy bills are still pending in Congress, but there are doubts about whether lawmakers are ready to take action. One incentive: Businesses want federal preemption of state privacy laws.

Federal approach: Bush is aggressive on privacy law enforcement but has shown little interest so far in privacy legislation.

Lawsuits: A threat, but showing damages is difficult.

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FRANK HAYES/FRANKLY SPEAKING

Hit the Road, Sam!

CONGRATULATIONS, SAM PALMISANO. Sure, you've been Lou Gerstner's heir apparent for the past year or so, ever since you became IBM's president (see page 21). But "heir apparent" doesn't mean a whole lot in this business — not until you nail down the top job. Now you have. Starting in March, you're in charge at IBM. You get to run the show. You'll be the big man in Armonk.

Now get ready to kiss Armonk goodbye.

Nine years ago, IBM was in trouble — deep trouble. IBM was a company whose business model depended on it being at the top of the IT industry. But IBM wasn't on top nine years ago. IBM was losing money by the billions.

The hot-air sector of the IT industry said IBM couldn't survive without breaking itself up. The pundits and columnists and blowhards agreed that IBM needed a technologist as boss, and they insisted that IBM would have to scale itself back to some core competency to stay afloat, in whatever diminished form.

Yeah, right. Instead of a techie, we got cookie man Lou Gerstner. And instead of breaking IBM up, the man from Nabisco built it back up to being a broad-based industry leader.

Gerstner did that by grinding IBM's sacred cows into hamburger. At the old IBM, hardware was king and the mainframe was God. Some IBM products were intentionally crippled so they wouldn't take sales away from other IBM products. And for IBM salespeople to sell non-IBM products was heresy.

Lou Gerstner dumped all that. Today at IBM, services are the big moneymaker. Nothing gets crippled, at least not on purpose. And nothing is out of the question — including selling competitors' products, if that's what it takes to close the deal.

Gerstner did find a core competency for IBM, though: He changed IBM from a computer company to a *computing* company.

So whatever customers needed, that was what IBM delivered. When that meant delivering services, IBM delivered services. When it meant trucking in somebody else's PCs or servers, that's what was on the truck. When it called for once-unthinkable products like Linux mainframes, that's what IBM produced.

Instead of moving hardware out of IBM warehouses and into customers' data centers, Gerstner concentrated on moving money out of customers' wallets and into IBM's pocket. And IBM was successful again.

Now, Sam Palmisano, it's your turn to get the hot-air treatment. Some of the same people who said nine years ago that IBM needed a technologist to break it up are saying now that as a 29-year IBM insider, you're the wrong guy for the job of keeping it together. That you don't have the vision to see where Big Blue should go o how to get it there. That your best bet is to focus on improving IBM's hardware revenue.

Baloney. That's advice for the old Big Blue, the computer company. Customers hated that old IBM. They hated being locked into the hardware and software and architectures IBM shoved down their throats. They wanted to wriggle out from IBM's grip, and they ended up buying just about anything *but* IBM to escape.

But today, they're not trying to wriggle out. They're lined up to buy IT services from the new Big Blue — IBM the computing company.

Those same customers will also buy more IBM hardware and software — *if* IBM has what they need. And customers will tell you what they need, what problems they have to solve, what really matters to them. After all, IBM is the company they're hiring to make it all work.

All you have to do is offer what they need. But first, you have to find out what that is.

You've clocked a lot of face time with customers over the past 28 years. Now it's time to clock a lot *more* face time. Not to sell IBM products. Not even to sell IBM. But to listen.

And you can't do that in Armonk.

So congratulations, Sam Palmisano. Now pack your bags and get out of town. ◗

FRANK HAYES, Computerworld's senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

SHARK TANK

COMPANY'S NEW president, who has a heavy technical background, calls in IT director pilot fish and snarls, "Our @#$%! network is absolute junk!" What's wrong? asks shocked fish. Turns out the boss doesn't have the Web access he requested weeks before. As he tries to log in to prove his point, fish asks, "Why are you spelling your name wrong at the log-in?"

PILOT FISH shows up for a meeting on improving communications, only to find the room empty. "Oh, the meeting has been canceled because it's not needed," says departmental secretary. "This should have been communicated to you."

AFTER TWO WEEKS of troubleshooting network problems at a construction site, pilot fish's co-worker walks in with his arms full of Ethernet cable – obviously stretched, with the insulation pulled apart in several places. "While the boss was out, a summer-help guy decided to pull it through the conduit as a favor," fish says. "When it was too hard to pull, he attached it to a tractor and pulled it through 500 feet of conduit."

HELP DESK pilot fish is looking for what's taking up all the space on a user's Outlook account. "Check the properties of your folders and tell me which one takes up the most space," fish instructs user. "How can I tell?" user asks. "Look for the folder with the largest number," fish says. User persists: "How do I tell what the largest number is?"

SOME PEOPLE can recognize when something comes broken right out of the box, sighs pilot fish who manages IT for lots of rural offices. One user notices her new mouse rattles when she shakes it. So she squirts some Crazy Glue into the hole on the bottom and fixes the rattle, once and for all.

Rattle my, er, mouse: **sharky@computerworld.com**. You score a sharp Shark shirt if your true tale of IT life sees print – or if it shows up in the daily feed at *computerworld.com/sharky*.

The 5th Wave

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"It's a wonderful idea, Ralph. But do you really think 'AnnoyBrainIP' and 'DumbMemoIP' will work as protocols on our TCP/IP suite?"

The Internet has the potential to positively change people's lives in ways unimagined before. Cisco is actively involved in programs to ensure that the Internet brings opportunity to every corner of the Earth. That is why we've created the Cisco Networking Academy Program. This educational program enrolls more than 160,000 students of all ages in 133 countries, providing them with the networking skills needed to participate in today's Internet economy. We invite you to become more involved.* **Discover all that's possible on the Internet, visit cisco.com/edu/academies**

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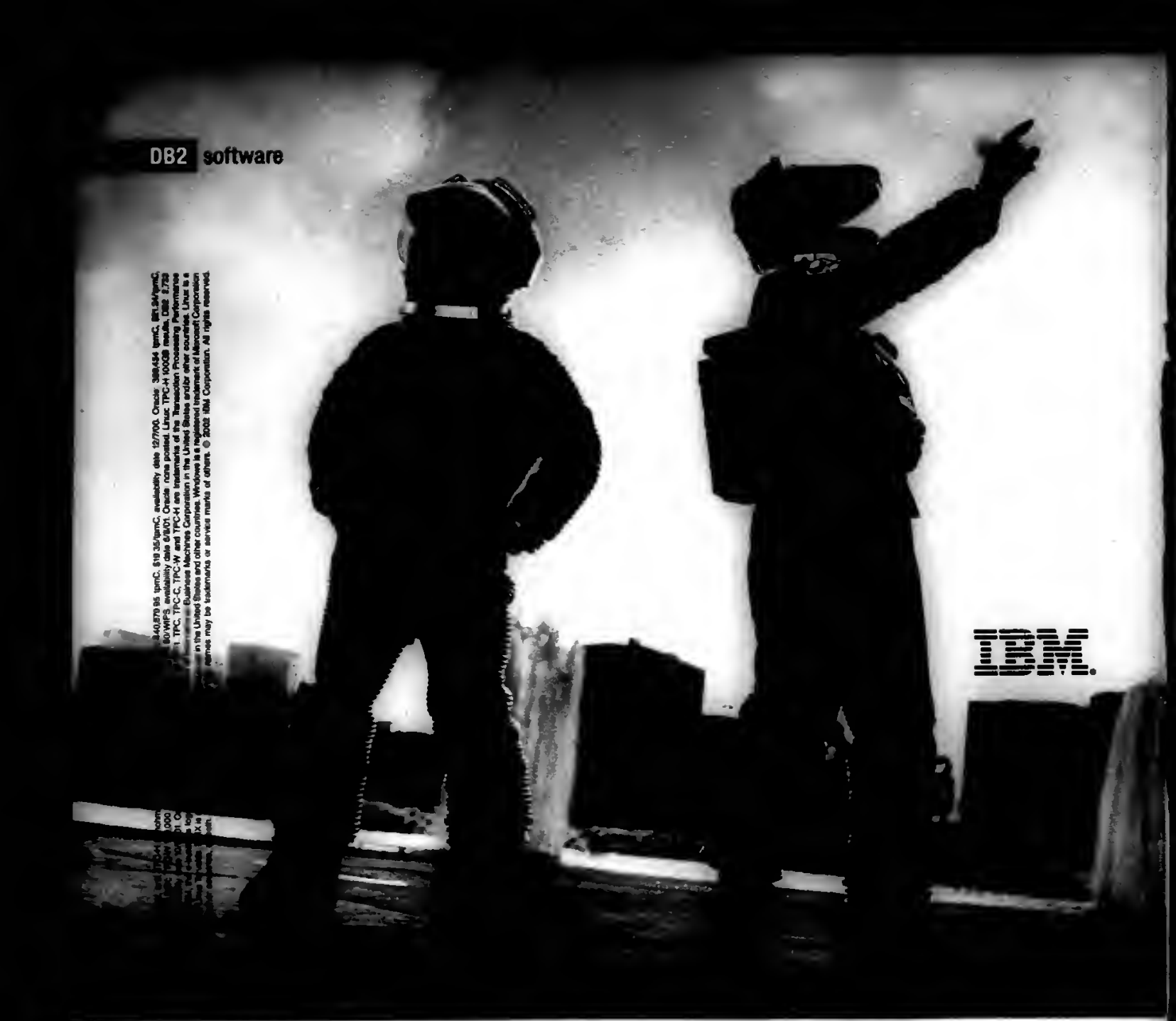

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